PQSCADA

Version 3.2

User Manual

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ELSPEC

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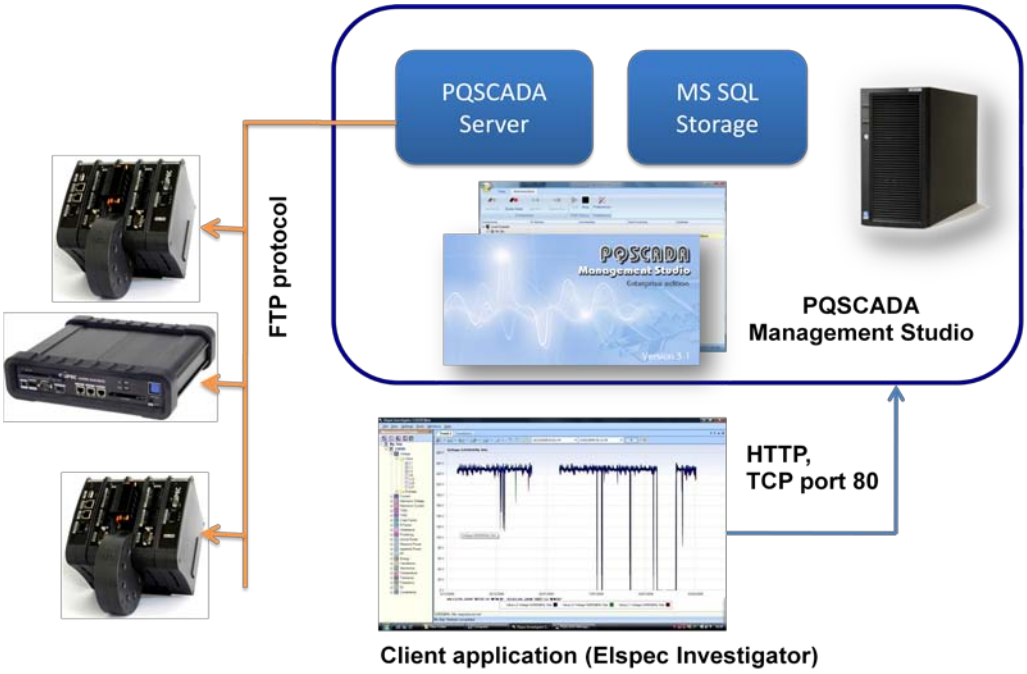
Overview

Innovative PQSCADA Enterprise Analysis software enables the operator to view, control, analyze, and monitor multiple measurement devices simultaneously. Data is accurately time-synchronized, within and across, ***Sites***

PQSCADA Enterprise System



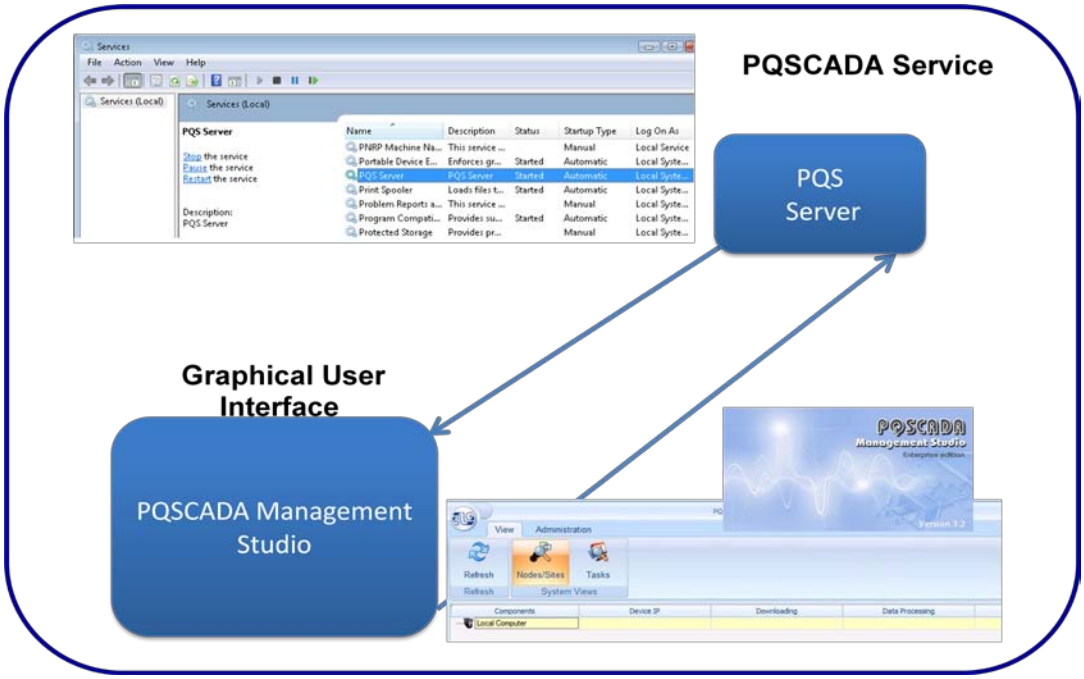
Note: This drawing depicts the master modules initiating the communication

The PQSCADA Enterprise System is installed on a personal computer providing unparalleled data monitoring and analysis functionality for all BLACKBOX devices. (For software installation instructions, please refer to **Installing the PQSCADA Software on page 7**).

- PQSCADA Management Studio**: The user interface (GUI) that is used to configure the PQSCADA Server as well as check status of the components (For more details, please refer to** PQSCADA Management Studio on page 2**) .**
- PQSCADA Server**: A windows serviced based application that runs in the background even when you are not logged in. (For more details, please refer to** PQSCADA Server on page 3**)**
- Client Application: Elspec Power Quality Investigator **Refer to the Investigator User Guide.**
- MS SQL Storage: database engine: **An SQL Database engine used by the PQSCADA server to store and process the data.**

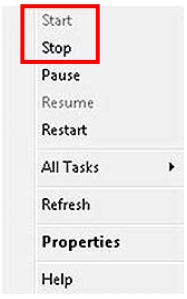
PQSCADA Management Studio

The PQSCADA Management Studio is a Graphic User Interface console used to communicate with the PQS Server. The PQS Server is a windows service.



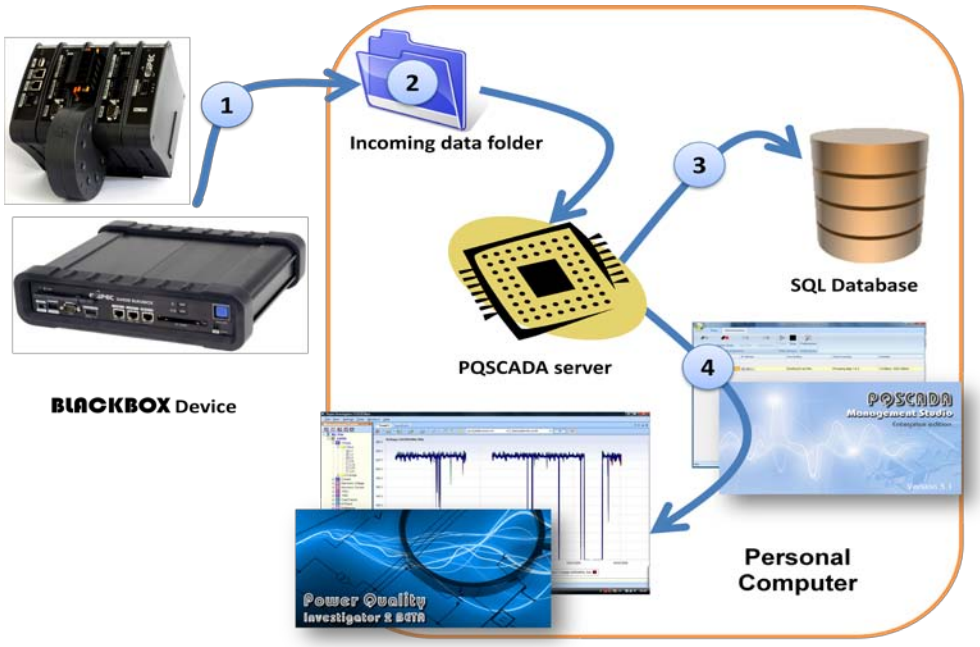
The PQSCADA installation procedure (Refer **to Installing the PQSCADA Software on page 7**) allows you to install both the PQSCADA Management Studio (for a detailed explanation, see **Management Studio on page 24**) and the PQSCADA Server (PQS service). In order to stop and/or start the PQS service, you may use the Graphical User Interface (GUI) as below or by accessing the **Services** through windows configuration. (Refer to **Appendix F: Starting/Stopping PQS through Windows on page 109****.**

PQSCADA Management Studio



Windows PQS Service

PQSCADA Server



Note: This drawing depicts the flow of data

The PQSCADA server is the heart of the BLACKBOX data management and analysis system. The main functionalities of the PQSCADA server are shown in the figure above and further described below with corresponding numbered marks:

1. **Data Collection (Downloading):** The PQSCADA server system is responsible for collecting all continuous data (PQZip files) from a connected device automatically. When the device is connected (wired or wirelessly) the PQSCADA server automatically checks for any new data availability using an FTP[1] communication protocol.

2. **Incoming Data Folder*:*** All new PQZip files found on a connected device are copied (the original files remain on device) to a temporary location on a local hard drive "Incoming data folder".

3. **Data Processing and Storage*:*** The next stage is data processing, in which the data is being organized for storage and quick access (Stage 1) and then a variety of electrical parameters are being calculated (Stage 2) based on the raw PQZip data. The reorganized PQZip data, as well as the calculated parameter statistics are being stored in a local SQL database. The files which have been processed and successfully inserted to the database are then removed from the Incoming folder.

[1] **Refer to Integrated FTP Server in the G4500 Operators Manual for more details**

4

Networking: The PQSCADA server integrates a dedicated HTTP (default port 80) interface that the PQS service listens to on port 80. Management studio and Investigator communicate with the service over that port.

Before Getting Started

Hardware Requirements

To install and run PQSCADA software:

- **Verify that the following requirements are met:**

Minimum Requirements		Number of devices		
		<3	4<20	>20
OS & Memory	Windows XP - sp3	1GB	2GB	Available: Consult Elspec Technical Support
	Windows 2003 - sp2	1GB	2GB	
	Vista - sp1	2GB	2GB	
	Windows 2008	2GB	2GB	
	Vista x64 – sp1	2GB	2GB	
	Windows 2008 x64	2GB	2GB	
Recommended Requirements				
Processor (# of cores)		1	2-4	
Disk space		80GB	300GB	

- **The recommended disk space for each device is 1GB of temporary disk space and at least 15GB of database disk space for each year of saved data.**
- **We recommend that each processor be at least 2GHz. Using slower processors might affect performance.**
- **It is also possible to have the database on a remote server, see further notes about this.**
- **We recommend a dedicated server for SQL Engine/Databases for large installations (If SQL is installed on the same server as PQSCADA, we recommend a min. of 2 GB of RAM memory).**
- **Laptops can work fine but since they are usually slower than desktop servers and their disk is usually much slower it is recommended not to install more than 5 devices on the PQSCADA running on a laptop.**

Software Requirements

The use of the PQSCADA software requires the following additional application software to be present on your system.

- **This PQSCADA version requires** INVESTIGATOR ver. 2.3.0.17 **and up**.
- MSI Installer-**Microsoft Windows Installer is an engine for the installation, maintenance, and removal of software on most recent Microsoft Windows systems. (Included with XP SP3 and up).**
- .NET Framework 3.5 SP1 **A Universal platform developed by Microsoft that provides identical functions for a variety of languages(C#, Visual**

Basic, Java). It is also designed to facilitate development of web applications. (Enable communication between clients and servers)

If you currently do not have these programs installed on your PC, then please refer to **Appendix C: Installing Pre-requisites on page 98.**

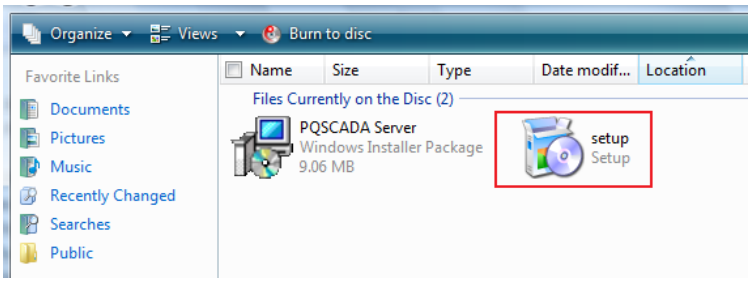
Installing the PQSCADA Software

The following procedure describes a new installation of the PQSCADA software application. For upgrading from a previous version, please refer to **Upgrading the PQSCADA software on page 11.**

To install the PQSCADA software:

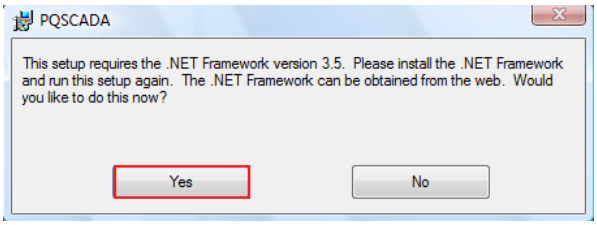
1. Navigate to the files on the CD at **Software→PQSCADA** or link at www.elspec.biz/PQSCADA/PQSCADA 3.2.0.33.zip.

The files appear as below.

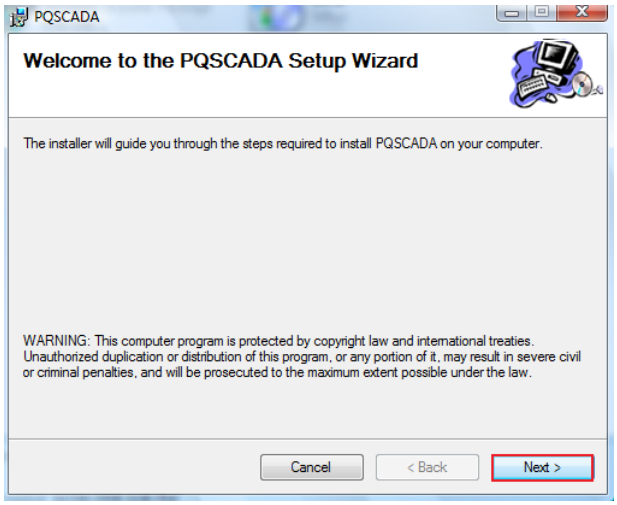


2. Navigate to the **PQSCADA setup.exe** file, then double click **setup**.

If the .NET Framework 3.5sp1 program is not present on your system, the following message appears. (Refer to **Installing .NET Framework 3.5sp1 on page 100)**

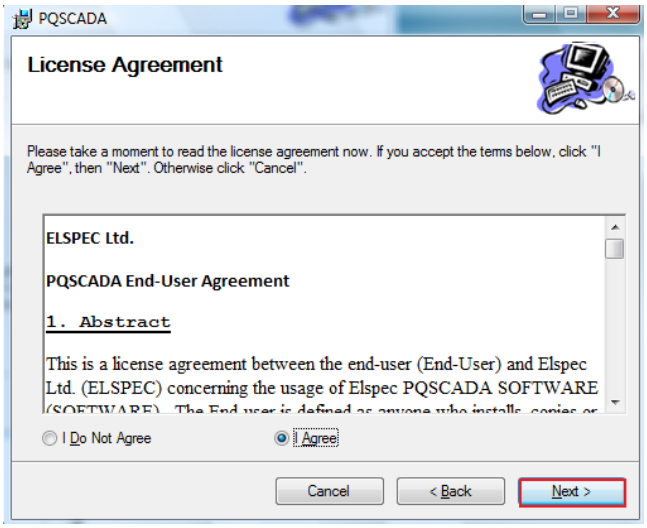


The Welcome screen appears.



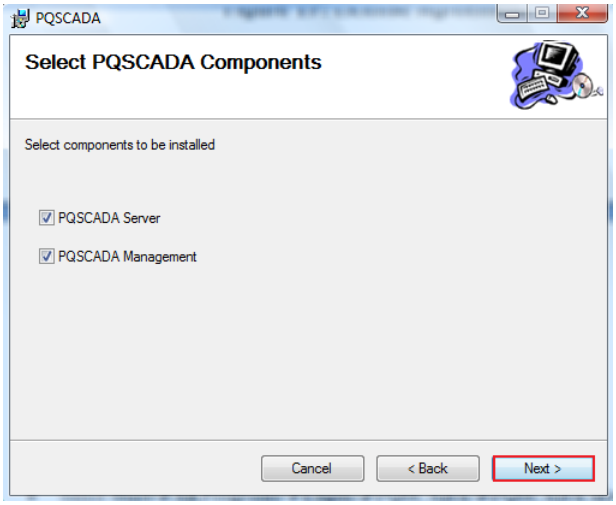
3. Click **Next**.

The License Agreement window appears.



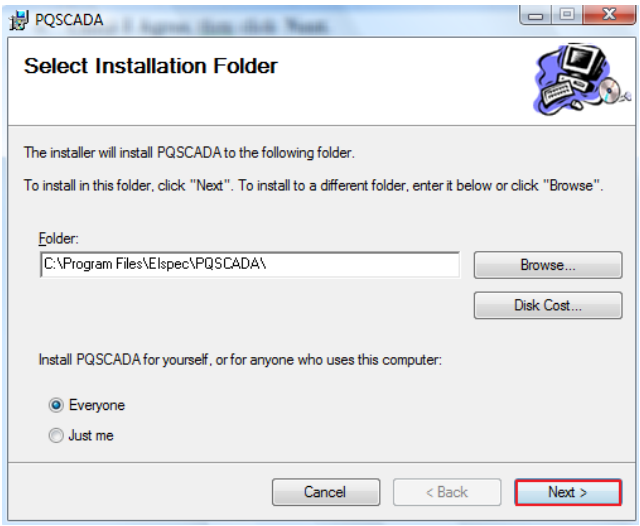
4. Check **I Agree**, then click **Next.**

The Select PQSCADA Components screen appears.



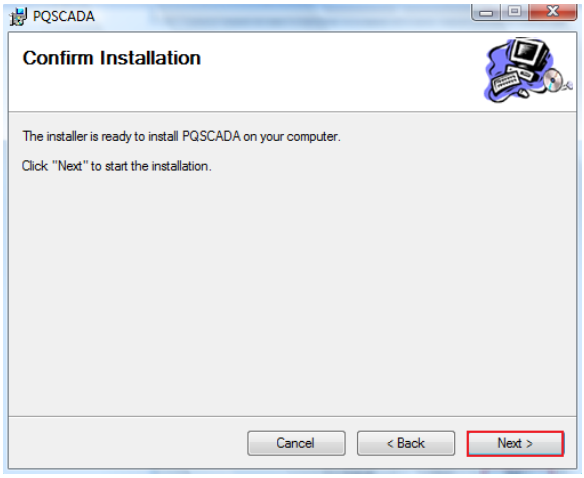
5. We recommend selecting both components, then clicking **Next. (for** detailed explanation see **PQSCADA Management Studio on page 2**).

The Select Installation Folder screen appears



6. Make desired selections, then click **Next**.

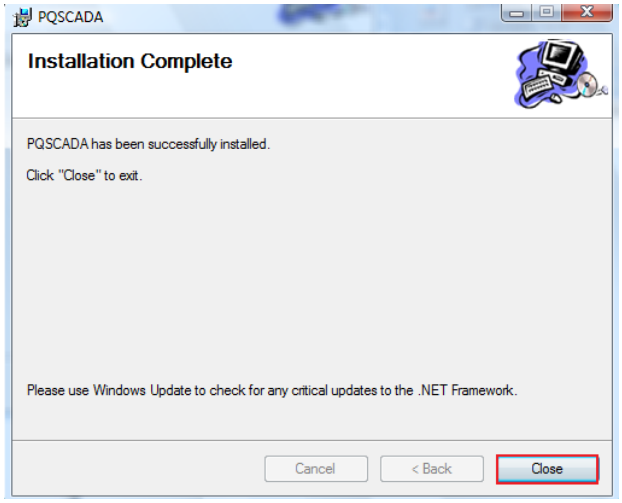
The confirmation screen appears.



7. Click **Next** to confirm the installation.

The PQSCDADA Installation commences.

When complete, the **Installation Complete** window appears.



8. Click **Close** to complete the installation.

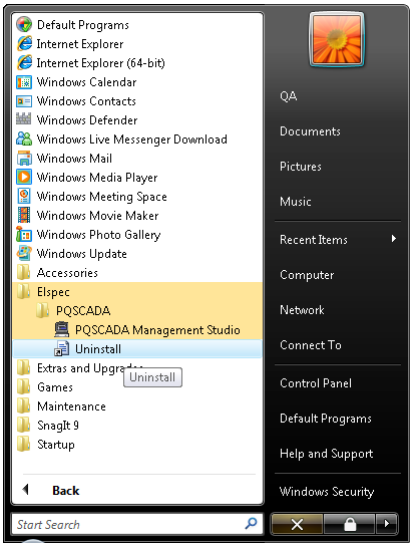
The PQSCADA Server software is currently running in the background. .

Upgrading the PQSCADA software

This upgrade is intended for versions 3.1.xx and later. If you have an older version, please refer to **Appendix D: Upgrading from 3.0 on page 102** before proceeding. The upgrade procedure consists of the following:

- **Uninstalling the previous PQSCADA Management Studio**
- **Installing the new PQSCADA Management Studio**
- **Upgrading the Database**
- **Re-calculating Parameters (optional)**

To upgrade the PQSCADA software:



Uninstall the previous PQSCADA Management Studio

- **Select** Start→All Programs→Elspec→PQSCADA→Uninstall

Install the New PQSCADA Management Studio

- **Install the new version of PQSCADA (please refer to** Installing the PQSCADA Software on page 7)

Upgrade the Database

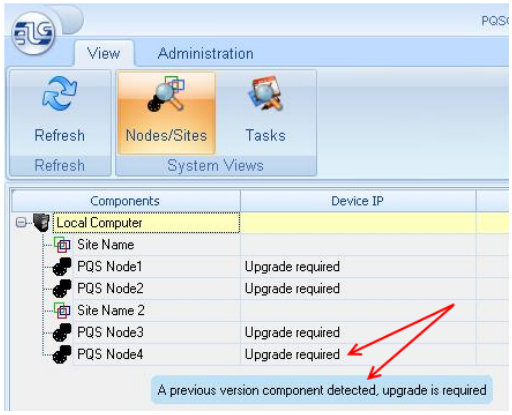
This consists of rebuilding the structure of the database only. In previous versions of PQSCADA, this step also comprised re-calculating the parameters. In this version of PQSCADA, recalculating parameters is an optional step.

To upgrade the database:

1. Click the 

icon on the desktop

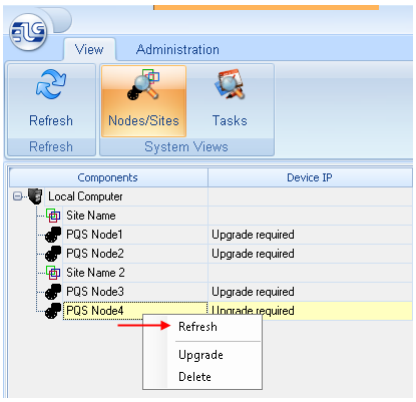
The PQSCADA Management Studio window appears with two ***Sites*** (**Site Name** and **Site Name 2**) from a previous PQSCADA version.



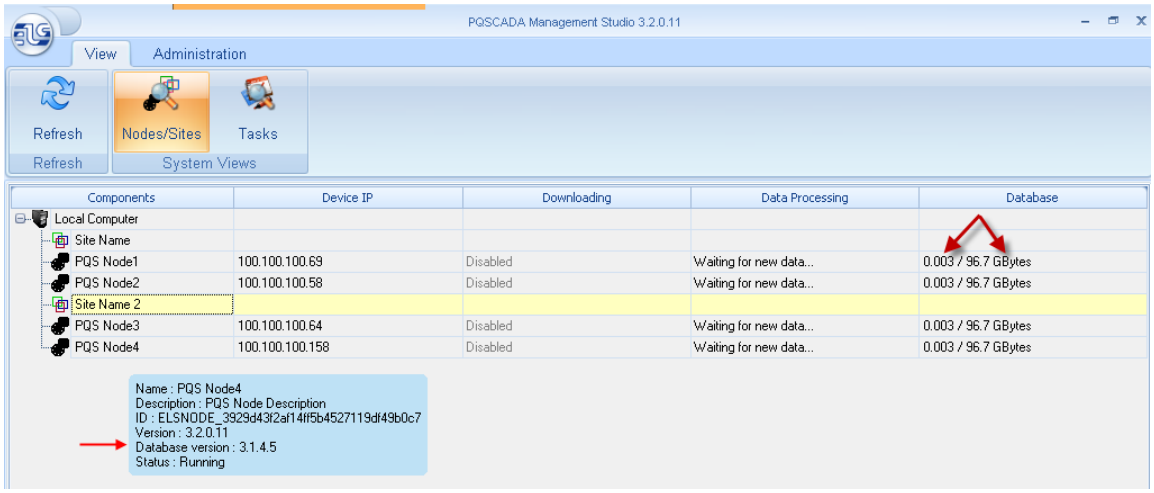
Each ***Node*** that needs to be upgraded is marked in the device IP column. Also, as the mouse is passed over a ***Node*** or ***Site***, the message in the blue highlighted box appears that an upgrade is required.

2. Right click the ***Node*** or ***Site***.

The dialog box appears:



3. Click **Upgrade** for each ***Site*** and ***Node*** individually.



You may choose to upgrade the Site or Node first. The order of operations is not critical. As each Node is upgraded, the database column indicates the size of the database file in relation to the entire available free disk space.

The blue box indicated in the figure above shows the original database version and the current version of the PQSCADA software.

Recalculating the Parameters

This optional step allows you to recalculate the desired parameters, if needed Since the process of recalculating parameters can take a considerable amount of time (approximately two weeks to calculate one year's worth of data). We recommend that you only perform this procedure if it is necessary.

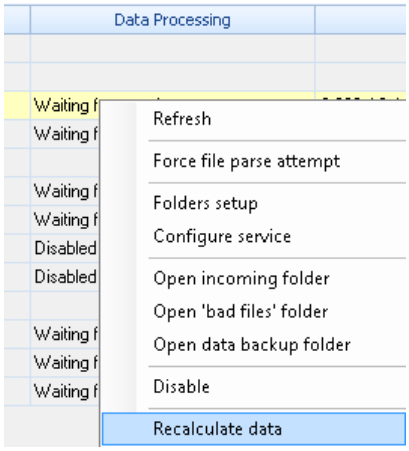
- **You have added a new parameter that needs recalculated in an existing database.**
- **An existing parameter that has been calculated with a new algorithm that differs from the method used on the previous version.**
- **In specific cases, refer to the table below. (taken from the Release notes)**

Upgrading from Version to Version	Changed/Added Parameters*
3.1.1.0->3.2.0.33	**All the parameters in single phase systems** **Unbalance parameters**

	Idc harmonic
3.1.4.5->3.2.0.33	**Unbalance parameters** **Idc**

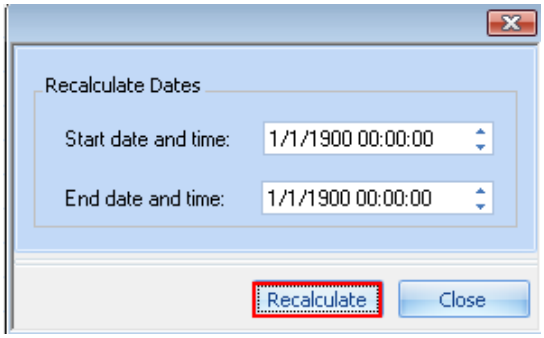
*** all other parameters will have the same values after recalculation**

To recalculate the parameters:



1. From the PQSCADA main menu, right click the desired ***Node*** in the **Data Processing** column.
2. Select **Recalculate data.**

The **Recalculate Dates** screen appears.



3. Set the desired start and end time.
4. Click **Recalculate.**

PQSCADA Quick Start

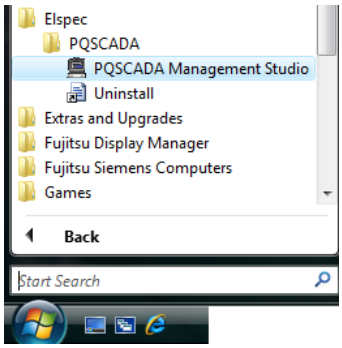
This section is intended for the first time user as a **Quick Start** into the most basic critical functions of the PQSCADA Management software. For a complete comprehensive explanation of all PQSCADA components and functions, please refer to **Management Studio on page 24**.

Step 1: Starting PQSCADA Management Studio

To start the PQSCADA Management Studio:

- **Click the** 

icon on the desktop or select Start→All Programs→Elspec→PQSCADA→PQSCADA Management Studio**.**



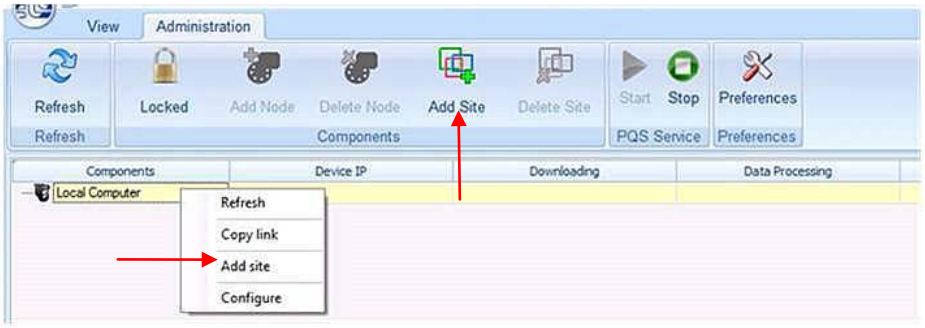
The PQSCADA Management Studio window appears.

The Management Studio opens into the View console as above. There is also an Administration console as described in the

Administration Console on page 26.

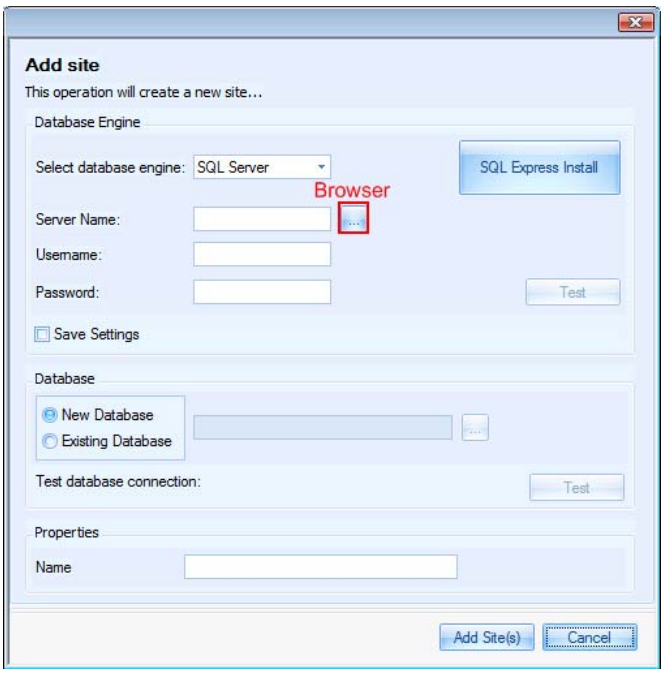
Step 2: Adding a New Site

To add a new Site:



1. Right-click **Local Computer** then select **Add Site** or select **Add Site** under the Administration tab.

The Add **Site** dialog box appears with an explanation of key terms to follow.



- Select Database Engine**: Identifies the database ending as an SQL type server**
- Browser button**: The browser button allows you to search for an available database server**
- Server Name**: the name assigned to the server**
- User Name**: The name of the user as defined for the database server.**
- Password**: User Defined**

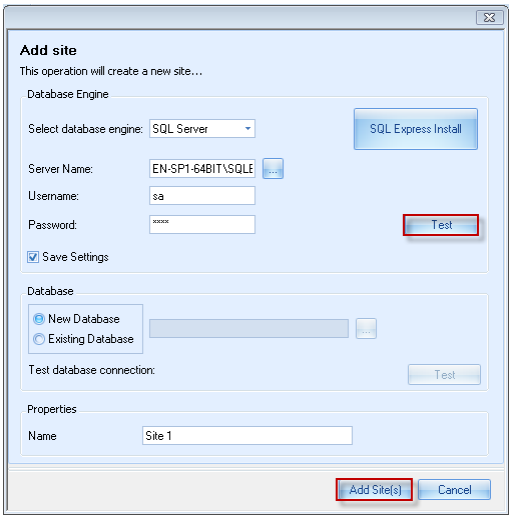
SQL Express Install launches an automatic installation of the SQL server where most parameters are pre-configured. Please refer to *Appendix B: SQL Express Install on page 94*. *We recommend using SQL Express only for evaluation purposes.*

2. Click the **Browser** button next to the Server name.

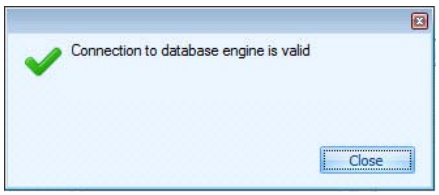
The Select Database Server window appears.

3. Select **Local Servers** tab. You may access remote databases through the **Network Servers** tab).
4. Double click the desired database (We are using an SQLEXPRESS database in our example).

The Add **Site** window reappears.

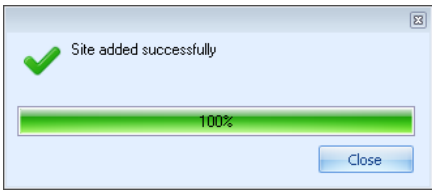


5. Enter your **User name** (**sa**) and **Password (PQSpqs12345).**
6. Click **Test** to verify the connection.



7. Select **Save Settings. (** recommend not mandatory)
8. Select **New Database** in the database field. (assuming a first time installation)
9. Assign a user defined name for the ***Site*** (may be changed at any time).
10. Click **Add *Site***(s) when complete.

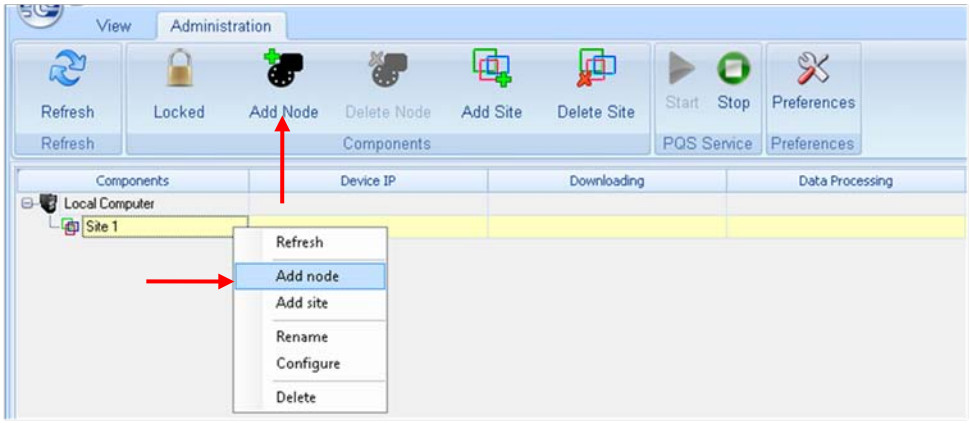
A successful ***Site*** completion window appears.



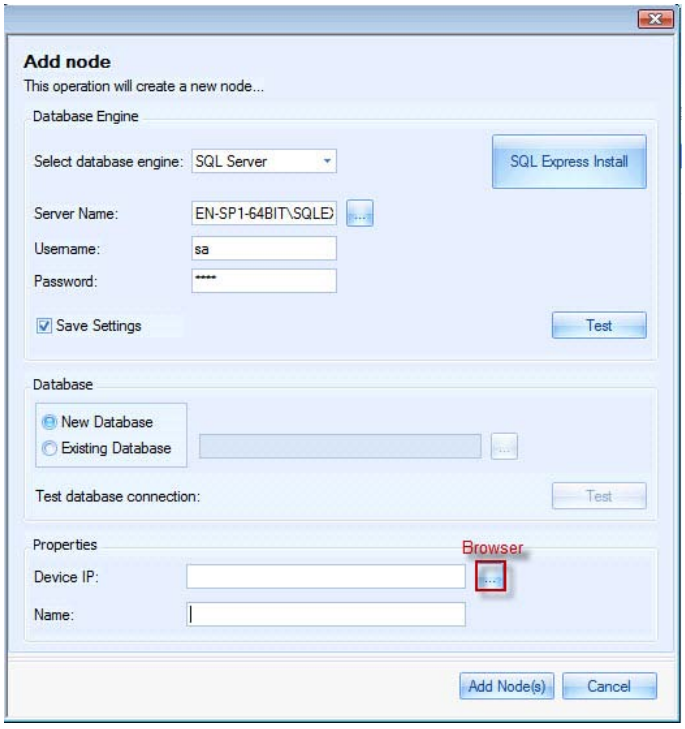
Step 3: Adding a New Node

To add a new Node:

1. Right-click the ***Site***, then select **Add *Node*** or Select **Add *Node*** under the **Administration** tab.

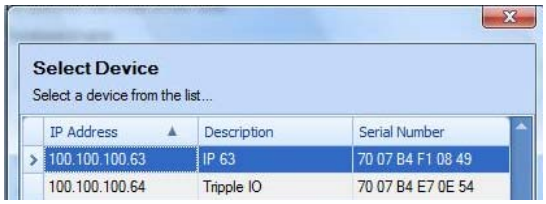


The **Add Node** dialog box appears.



2. In the database field, select **New Database**
3. Click the browser button next to **Device IP** in order to attach devices to ***Nodes***.

The **Select Devices** window opens listing all available devices.



The **automatic** device discovery is activated now and should find all devices on the local LAN if UDP broadcasting is allowed. You may select multiple devices by holding the **Shift key or the Ctrl** key. Each device will be attached to a separate ***Node***

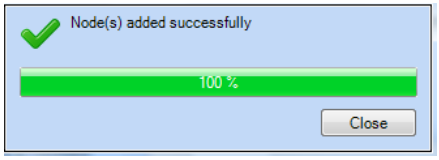
4. Double click the selected device(s).

The **Device IP** and **Name** appear in the window.

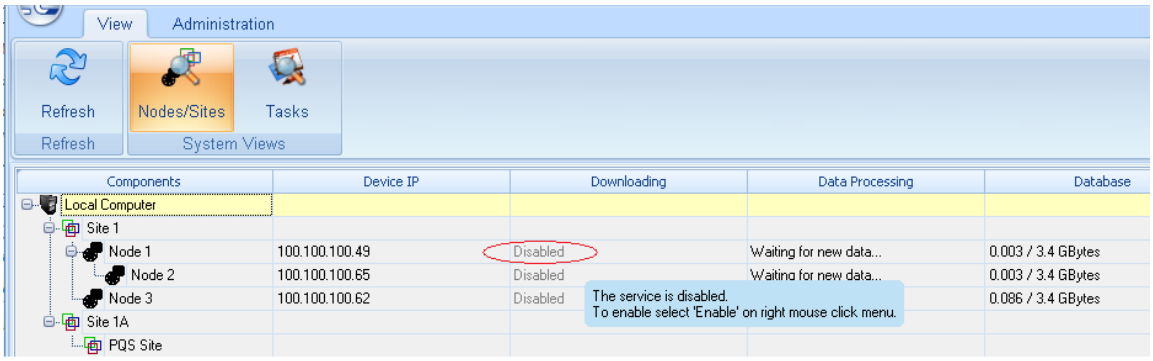
You may enter the device IP manually or you may enter multiple devices separated by a semi-colon. You may change the Device name at any time. In our example we changed from **IP 63** to ***Node* 1**.

5. Click **Add Node**(s) to complete.

The Add **Node** Verification window appears.



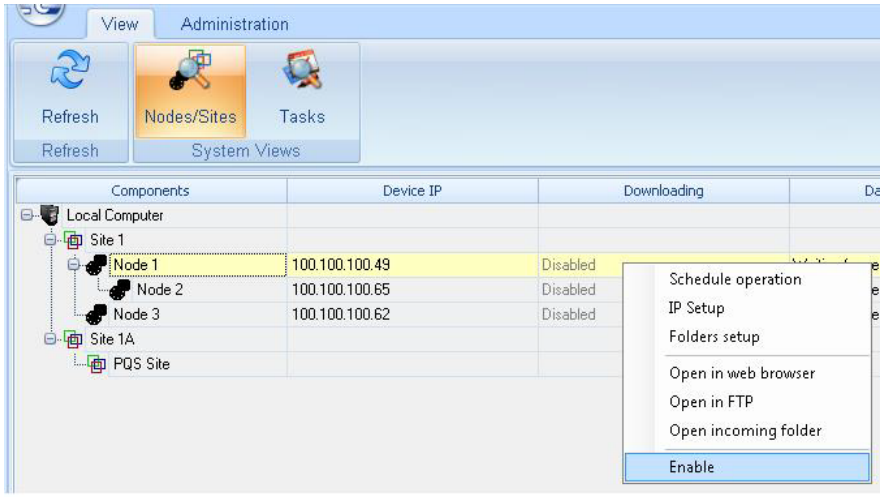
Step 4: Starting the Node



To start the *Node*:

1. From the main PQSCADA Management Studio window, right click **Disabled** in the **Downloading** column.

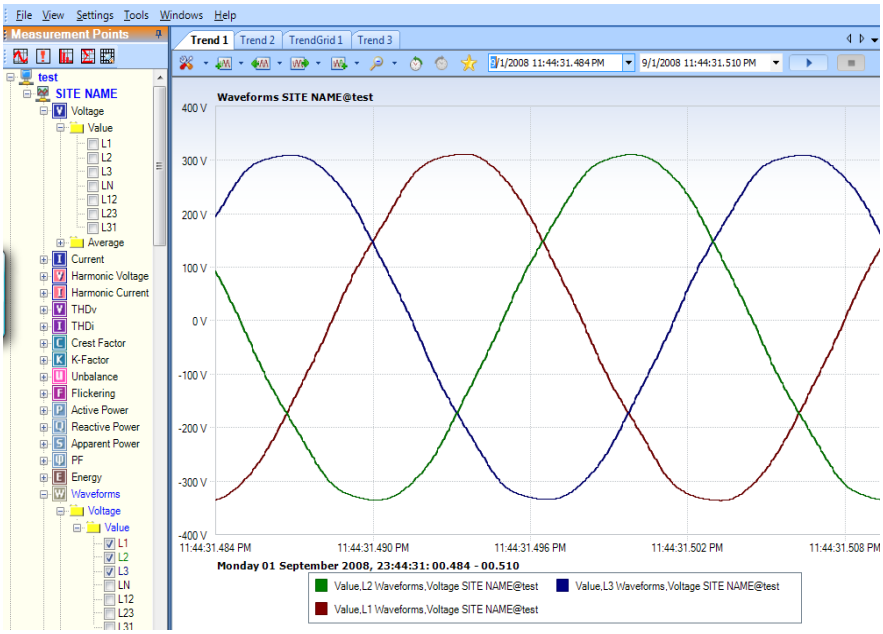
A drop down menu appears.



2. Click **Enable**.

Step 5: Viewing a Node in Investigator

If applicable, you may also verify the ***Node**'s* data by displaying the data in PQSCADA Investigator. You do not have to wait for all the data to finish processing before viewing the ***Node***. We recommend using a large time frame (for example **Last Year)** to display the data.

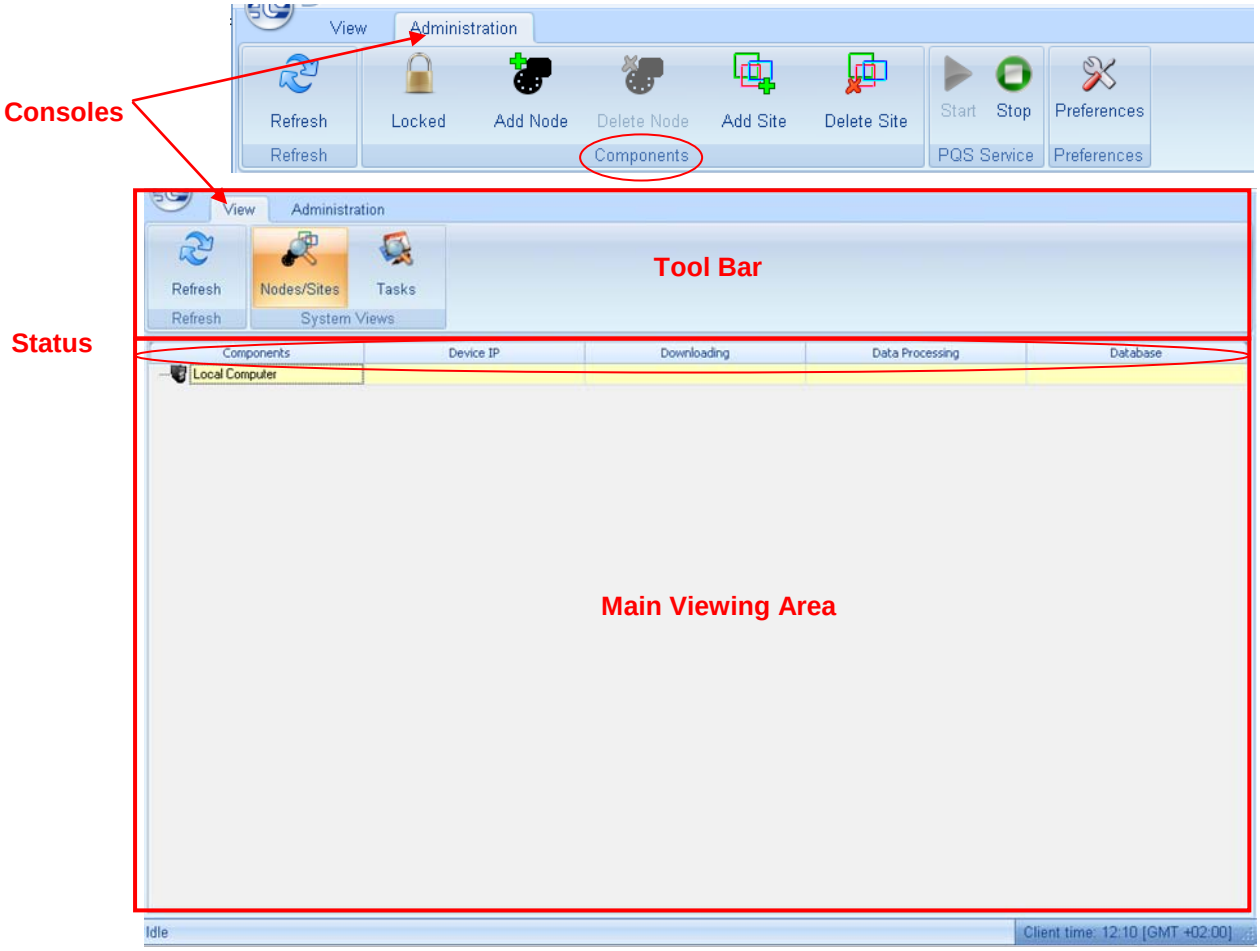


Management Studio

This section provides an in-depth detailed explanation of all PQSCADA functions. The PQSCADA Management Studio application is presented in an itemized format beginning with a look and explanation of the primary viewing screens, then an in-depth description and explanation of all of the functions and components of the software. For a **Quick Reference Guide**, please refer to **PQSCADA Quick Start on page 16**.

The Main User Screen

The PQSCADA user interface screen is comprised of three distinct sections; the **Tool Bar, Status Bar,** and the **Main Viewing Area**. The Tool Bar contains certain specific functional icons (components) specific to the active console. Two different viewing consoles are available; **View** and **Administration**. The main viewing area contains all of the ***Sites, Nodes,*** **Tasks, and Templates** for the grid.



Tool Bar

The tool bar contains the components that are used to build the infrastructure as well as manage the ***Sites*** and ***Nodes***. The selection of available components is dependent on the viewing console selected. The opening default screen is the ***Nodes/Sites*** selection in the **View** console.

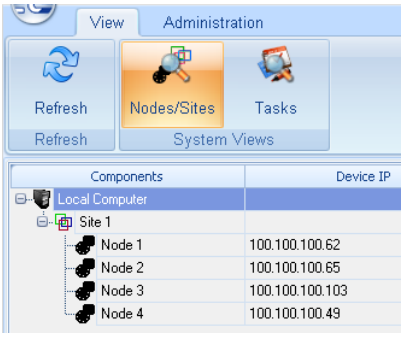
View Console

The View mode can be used to, both view and modify the ***Sites***, ***Nodes***, and tasks in the Main Viewing Area. In view mode there are no Component buttons therefore all functions are done by right clicking the component in the viewing area.

- Refresh**: To reset the** *Sites* **and** *Nodes* **if for some reason connection is lost**
- Nodes/Sites: **To view all available** *Sites* **and** *Nodes* **below in the main viewing area.**
- Tasks: **The tasks (for more, please refer to** Tasks on page 61)**.**

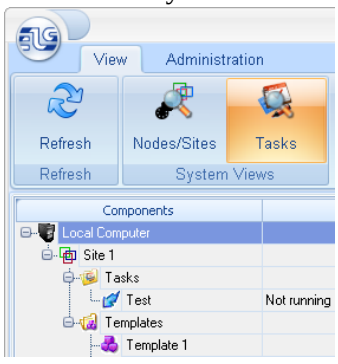
Nodes Sites

This selection allows you to view and modify only the active ***Sites*** and ***Nodes***.



Tasks

This selection allows you to view and modify active Tasks/Templates associated with the ***Sites***.

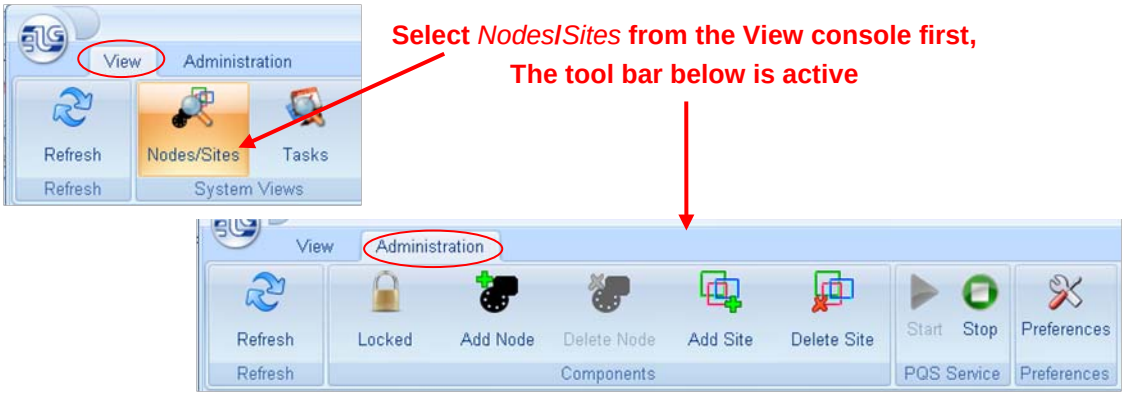


Administration Console

The Administration console provides component buttons that allow editing of PQSCADA components. The layout of the administration console changes according the selected view. The two views are ***Nodes/Sites*** and **Tasks**.

Nodes/Sites

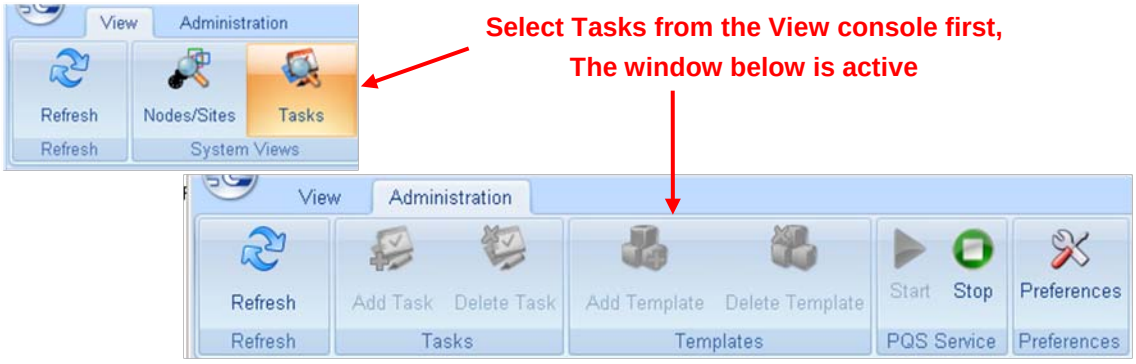
This selection allows you to view only ***Site*** and ***Node*** related component functions in the tool bar.



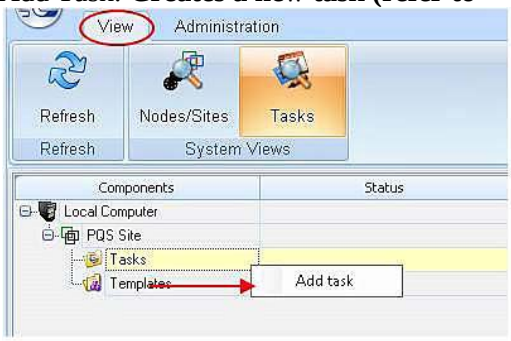
- Refresh**: To reset the** *Sites* **and** *Nodes* **if for some reason connection is lost**
- Locked: **To allow/disallow moving of** *Sites*/*Nodes* **by dragging and dropping. (please refer to** Hierarchical Site Construction on page 53**).**
- Add Node: **Add a** *Node***(s) to a** *Site* **(please refer to** Adding a New Node on page 37**)**
- Delete Node: **Remove a** *Node* **from a** *Site***. (please refer to** Deleting a Node on page 42**)**
- Add Site: **Add a** *Site***(please refer to** Adding a on page 31**)**
- Delete Site: **Remove a** *Site* **(please refer to** Deleting a on page 35**)**
- PQS Service: **To start and stop the PQS Service. (please refer to** PQSCADA Management Studio on page 2**)**
- Preferences: **Global user defined settings for the software (please refer to** Selecting Preferences on page 29**)**

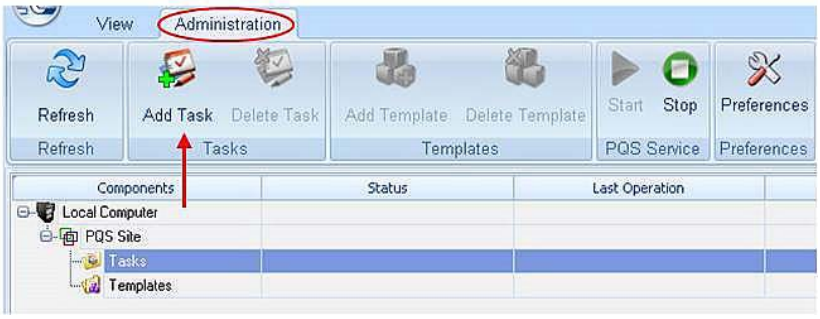
Tasks/Templates

This selection allows you to view only Task and Template related component functions in the tool bar.



- Refresh**: To reset the** *Sites* **and** *Nodes* **if for some reason connection is lost**
- Add Task: **Creates a new task (refer to**





- Adding a **Task** on page 59**)**
- Delete Task: **Removes a task (refer to** Deleting a Task on page 70**)**
- Add Template: **Create a new template (refer to** Adding a Template on page 72**)**
- Delete Template: **Removes a selected template (refer to** Deleting a Template on page 77**)**
- PQS Service: **To start and stop the PQS Service. (refer to** PQSCADA Management Studio on page 2**)**

- Preferences: **Global user defined settings for the software. (refer to** Selecting Preferences on page 29**)**

Only the components that are available are activated above. This depends upon the current status of the selected Site, Node, and/or template.

Selecting Preferences

In the Administration console, the global **Preferences** for the software are established in this section. The Preferences section is comprised of the following:

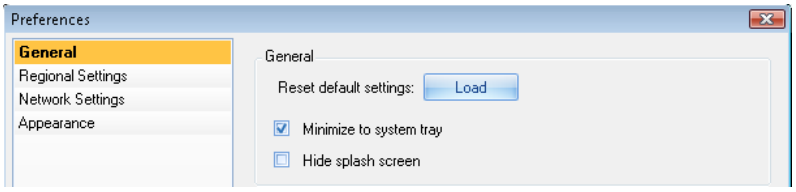
- **General**
- **Regional Settings**
- **Network Settings**
- **Appearance**

To select Preferences:

- **From the Administration Console, select** Preferences**.**

The default General default window appears.

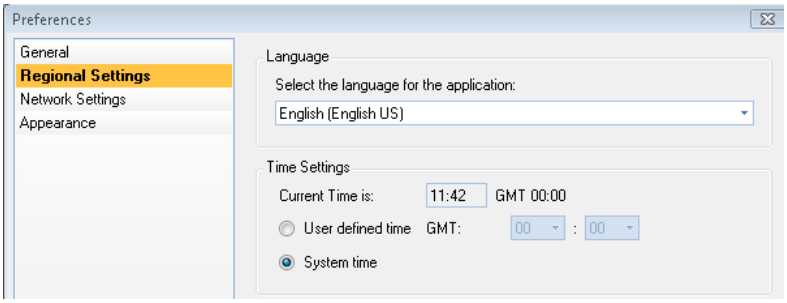
General



- Minimize to system tray: **The PQSCADA icon will reside in the bottom system tray when minimized. Double click the icon to restore the window. (default is unchecked)**

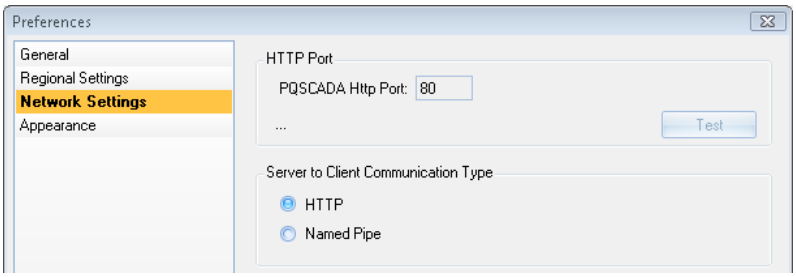
- Hide splash screen: **The opening splash screen does not appear when launching the program. This may be essential in some cases when connected remotely to a computer running the management console. (default is unchecked)**

Regional Settings



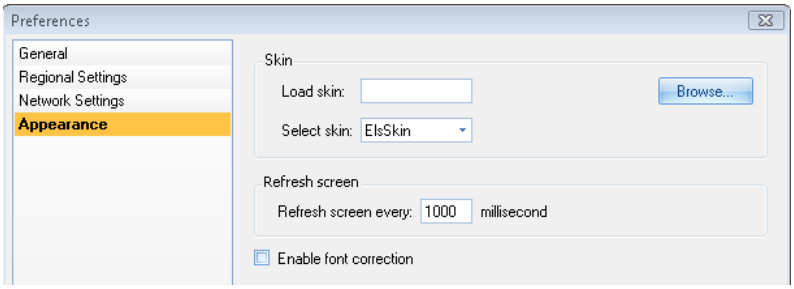
- Language: **A selection of regional languages.**
- Time Settings: **Change this setting if you would like to see all dates and time according to a different time zone. The default is System time.**

Network Settings



- PQSCADA HTTP Port: **The software uses Http port 80 as the default port to communicate with the** *Node***.**
- Server to Client Communication Type: **Choose the method of communicating with the server. In a case when HTTP Port 80 is blocked or occupied by another program, use** Named Pipe**. Default is HTTP.**

Appearance



- Skin: **Not applicable in this version.**

- Refresh Screen: **How often the screen is refreshed with new data. Lowering this value will result in a faster refresh rate, but will also cause the management studio to use more system resources. The default is: 1000 ms.**
- Enable font correction: **This allows the software to correct some font issues with certain Operating Systems.**

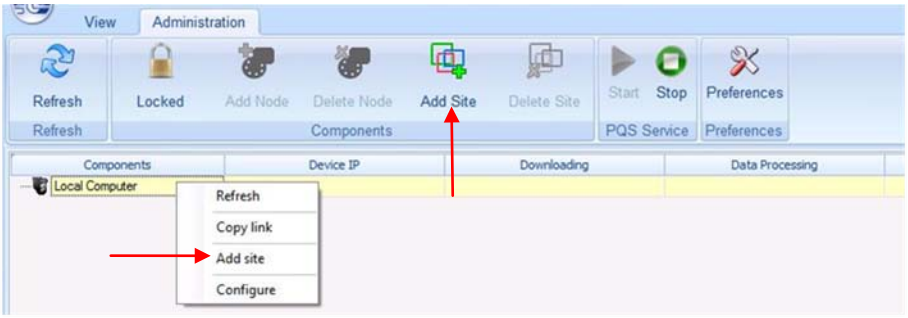
Sites

The ***SITE*** is a software component (logical representation) of a physical location(s) which represent a group of ***Nodes*** (devices). The SERVER (Local Computer) is the representation of the physical machine (on which the PQSCADA server application is installed).

The purpose of a ***Site*** is to organize the ***Nodes*** by a common set of characteristics (i.e. location). For each monitored device, a ***Node*** must be created.

Adding a Site

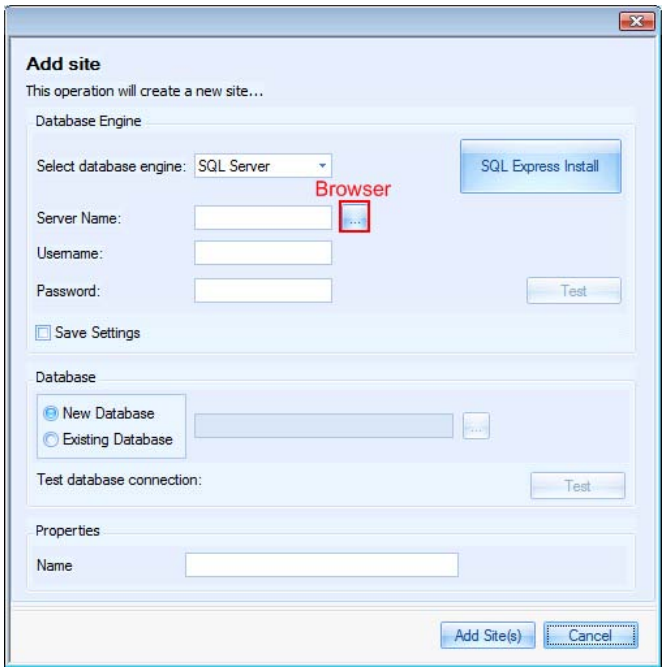
To add a new *Site*:



1. Right-click **Local Computer** then select **Add Site** or select **Add Site** under the Administration tab.

PQSCADA software requires an MS SQL Server Engine version 2005/2008. If you do not have access to an existing SQL Engine (locally or remotely, you can install a free limited version of SQL Server Express from the installation disk.

The Add **Site** dialog box appears with an explanation of key components to follow.



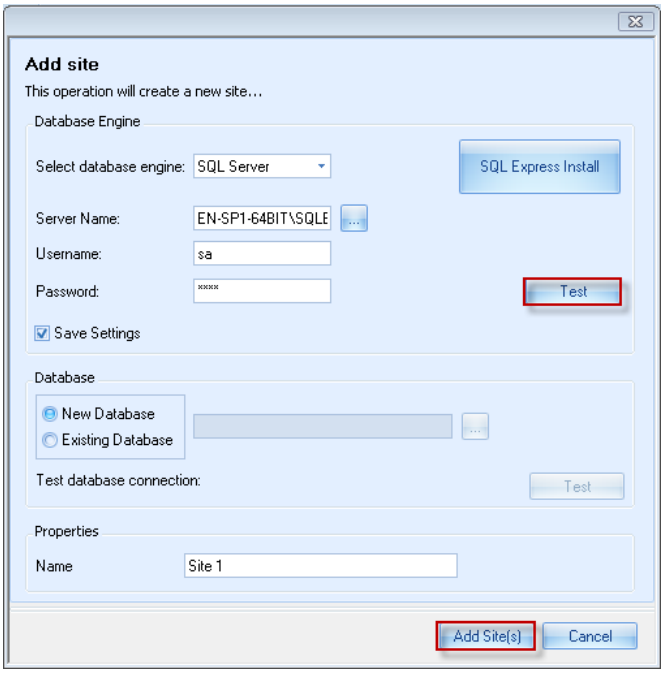
- Select Database Engine**: Identifies the database ending as an SQL type server**
- Server Name**: The name assigned to the server (Elspec default is PQS)**
- User Name**: The name of the user(Elspec server is pre-defined)**
- Password**: User Defined**
- Browser button**: Allows you to search for an available database server**

SQL Express Install launches an automatic installation of the SQL server where most parameters are pre-configured. Please refer to **Appendix B: SQL Express Install on page 94.** *We recommend using SQL Express only for evaluation purposes.*

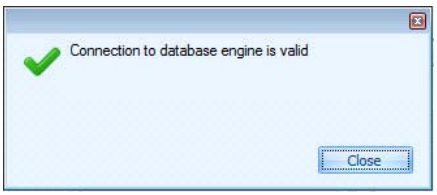
2. Click the **Browser** button next to the Server name.

The **Select Database** Server window appears.

3. Select **Local Servers** tab. (We recommend putting SQL on the Local Server; however you may access a remote database through the **Network Servers** tab).
4. Double click the desired database (We are using an SQLEXPRESS database in our example).
5. The **Add Site** window reappears.

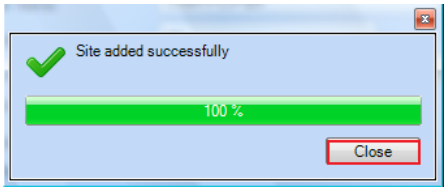


6. Enter your **User name (sa)** and **Password (PQSpqs12345).**
7. Click **Test** to verify the connection.



8. Select **Save Settings** (recommended not mandatory)
9. Select **New Database** in the database field.
10. Assign a user defined name for the ***Site*** (may be changed at any time).
11. Click **Add Site**(s) when complete.

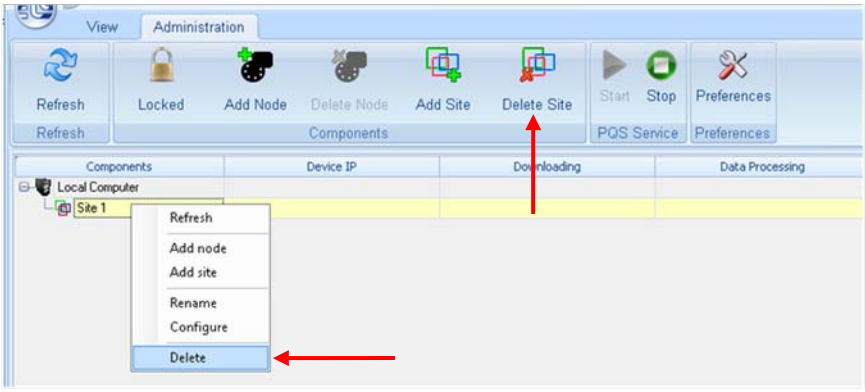
The Add **Site** window appears when complete.



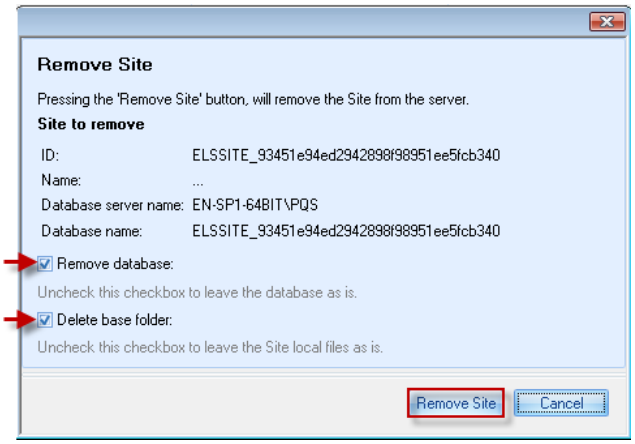
Deleting a Site

To delete a *Site*:

1. From the main window, right click **Site** name (**Site** 1 in our example)**,** then select **Delete** or select **Delete *Site*** under the Administration tab



The **Remove Site** dialog box appears with all of the ***Site*** specifications.



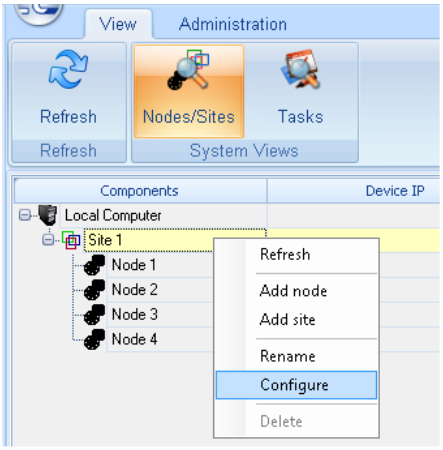
You have the option to leave/remove the database and database folder.

2. **Click Remove Site**.

Configuring the Site

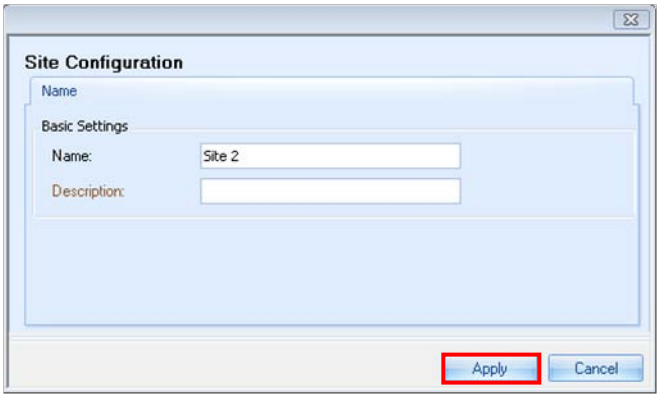
Configuring the **Site** is simply applying a user defined name and description to an existing ***Site***.

To configure the *Site*:



1. From the view or administrative console, right click the ***Site***, then select **Configure**

   The **Site Configuration** window appears.



2. Enter a user defined **Name** and **Description**.
3. Click **Apply** when complete.

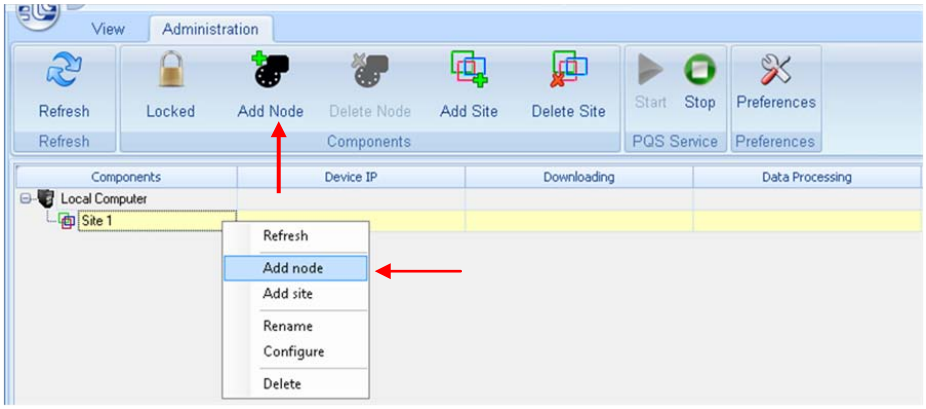
Nodes

A ***Node*** is a logical representation of the physical device location that performs all of the following functions:

- **Retrieves and de-compresses the PQZip files**
- **Parses and stores the data into the correct database.**
- **Calculates queries in real time.**

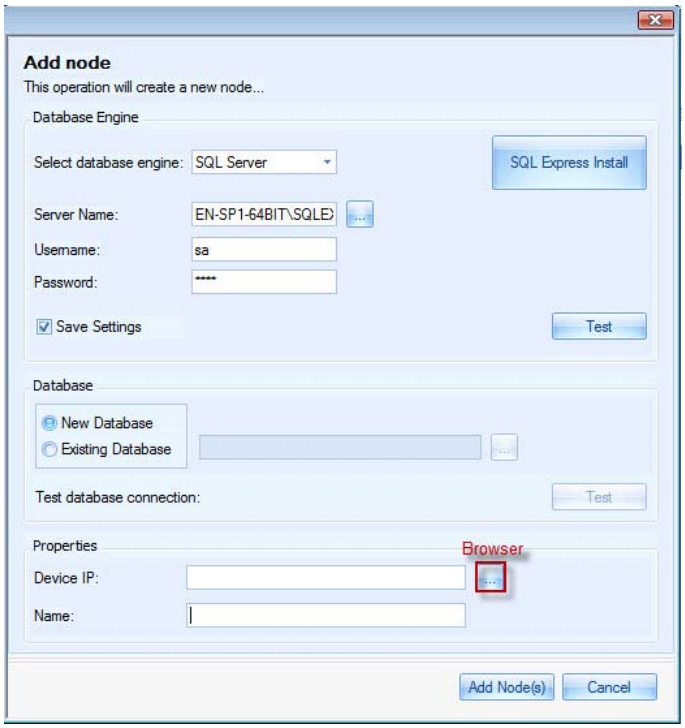
Adding a New Node

To add a new Node:



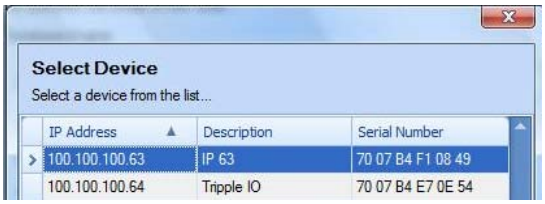
1. Right-click the ***Site***, then select **Add Node** or Select **Add Node** under the **Administration** tab.

The **Add *Node*** dialog box appears.



2. In the database field, select **New Database**
3. Click the browser button next to **Device IP** in order to attach devices to ***Nodes***.

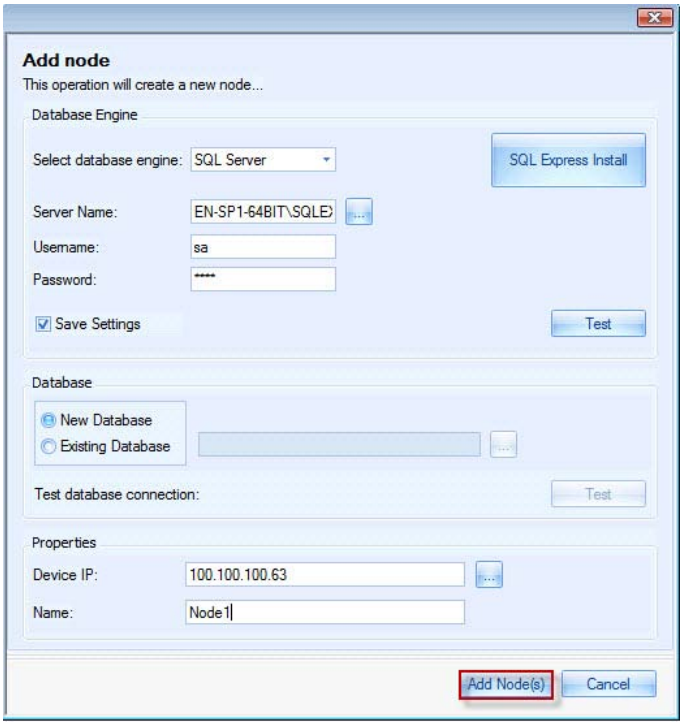
A window opens listing all available devices.



The automatic device discovery is activated now and should find all devices on the local LAN if UDP broadcasting is allowed. You may select multiple devices by holding the Shift key or the Ctrl key. Each device will be attached to a separate Node.

4. Double click the selected device.

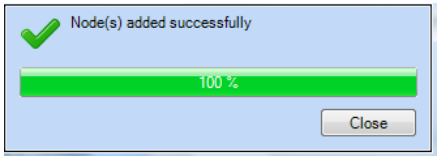
The **Device IP** and **Name** appear in the window.



You may enter the device IP manually or you may enter multiple devices separated by a semi-colon. You may change the Device name at any time. In our example we changed from **IP 63** to ***Node* 1**.

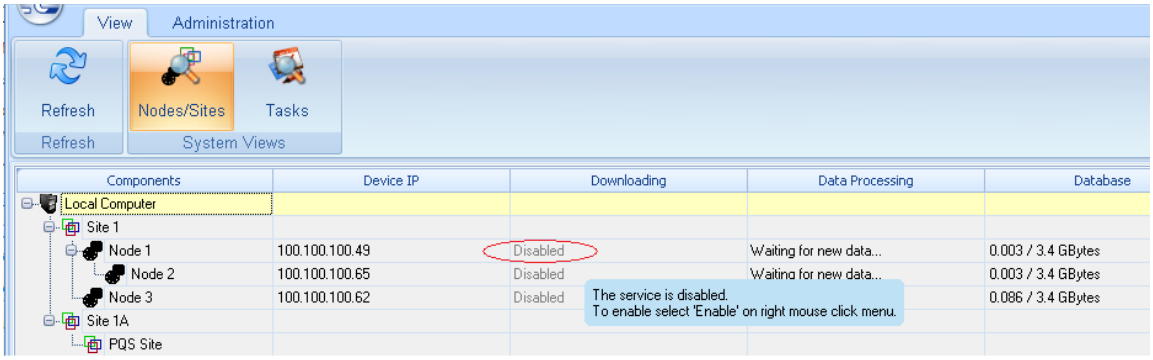
5. Click **Add Node**(s) to complete.

The Add **Node** Verification window appears.



Start Downloading the Data

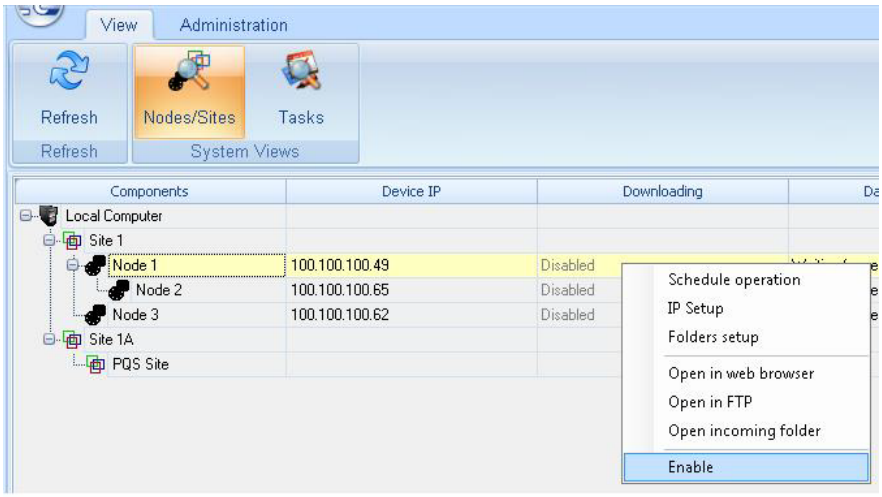
After both a ***Site*** and a ***Node*** are added, it is recommended to verify the ***Node*** is functioning. In order to verify ***Node*** operation, you must first enable the downloading of data**.** The downloading default is disabled as shown in the figure below:



To start downloading the data:

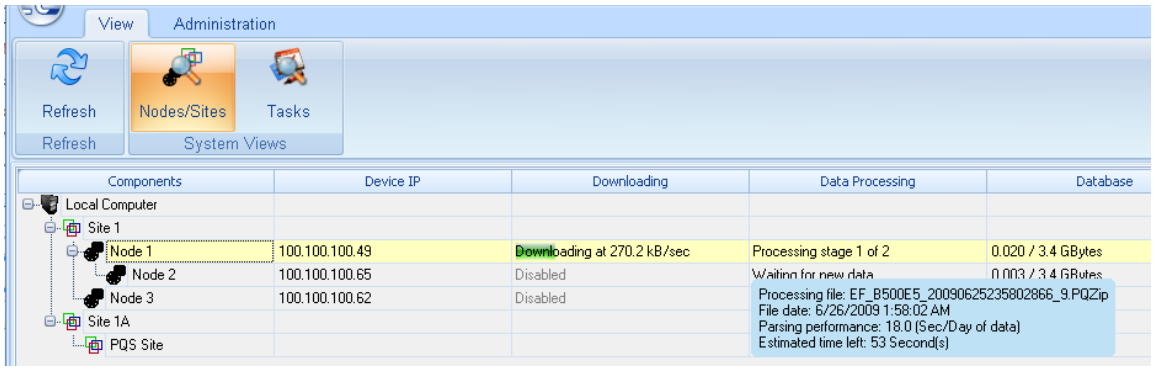
1. From the main PQSCADA Management Studio window, right click **Disabled** under the **Downloading** heading.

A drop down menu appears.

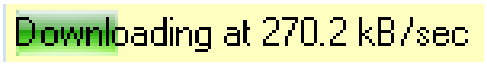


2. Click **Enable**.

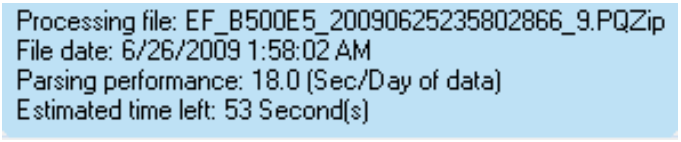
The database enabling process commences a two stage process.



You can see the data downloading status above. As the data is being downloaded, you are able to view, not only the downloading rate, but the file progress as well as below.

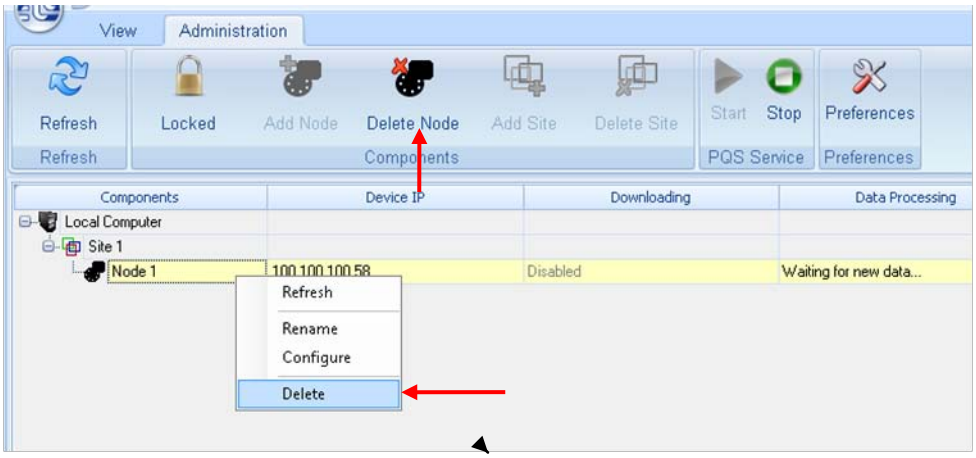


Passing the mouse over the Data Processing heading shows the time remaining as in the window below.

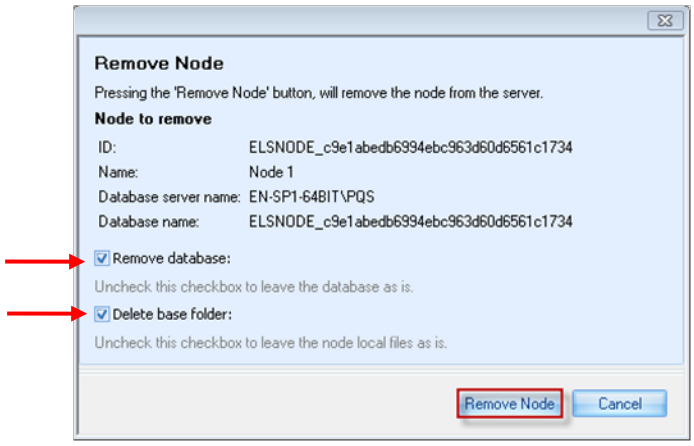


Deleting a Node

1. Right-click the ***Node*** , then select **Delete** or select **Delete Node** under the Administration tab



The **Remove *Node*** dialog box appears with all ***Node*** information.



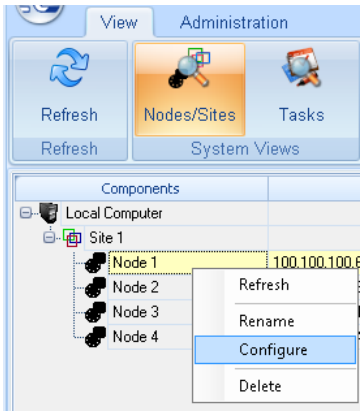
You may choose to leave the database and/or database folder active even though the ***Node*** is removed, un-checking the boxes.

2. Click **Remove Node**.

Configuring a Node

Each ***Node*** can be individually configured to collect data from the device according to pre-set parameters and settings. There are the following configurable parameters for ***Node*** configuration.

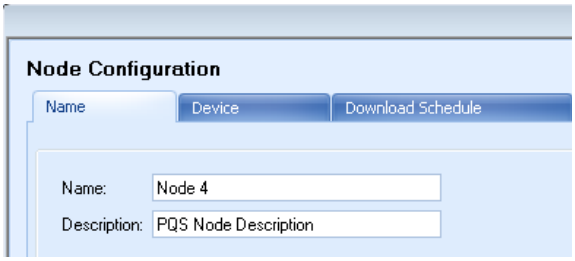
- **Name**
- **Device**
- **Download Schedule**
- **Data Processing**
- **Database**



To configure a *Node*:

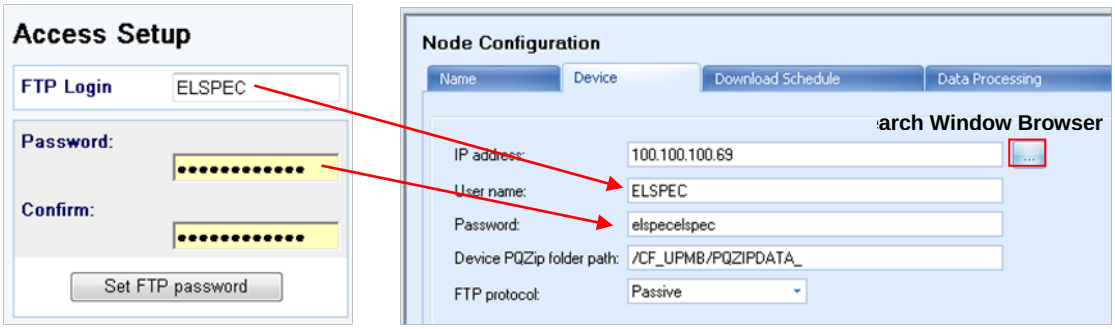
- **From the view or administrative console, right click the** *Node***, then select** Configure**. When complete with each component setting, click** Apply **to save changes.**

Name



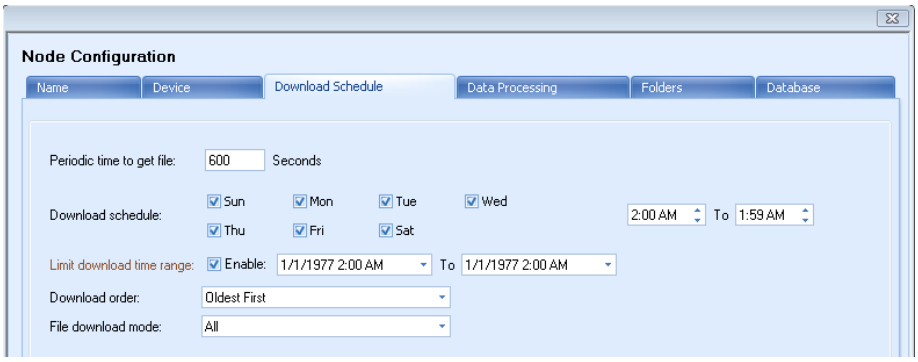
- Name: **A user defined name for the** *Node***.**
- Description: **A user defined description for the** *Node***.**

Device



- IP address**: Enter the IP address of the device or use the search window browser.**
- User Name**: Each device is shipped with a default user name (Elspec) as above. This name corresponds to the FTP login name set in the firmware of the device (Access Setup section). If you wish to change the user name here, then it also must be changed in the firmware.**
- Password**: The password corresponds to the user name above. It should be changed according to the device password. (the default password as shown above is** elspecelspec**).**
- Device PQZip folder path**: The specific path where the PQZip folders are stored on the device. We do not recommend changing this setting.**
- FTP Protocol**: The default setting is** Passive**.**

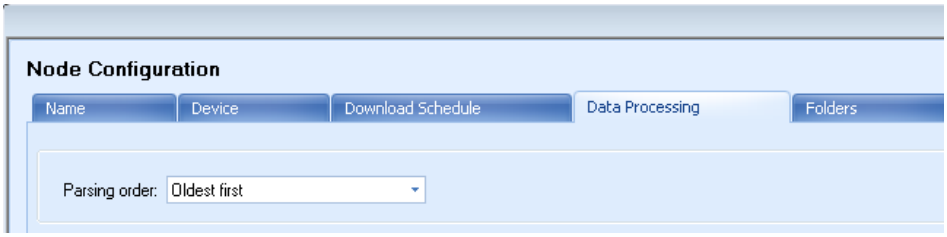
Download Schedule



- Periodic time to get file**: This is a user defined setting to determine the interval of time to retrieve the PQZip file(s) from the device. If multiple files exist, this setting is not relevant and there will be no delay.**
- Download Schedule: **The specific days and times to perform the file retrieval.**

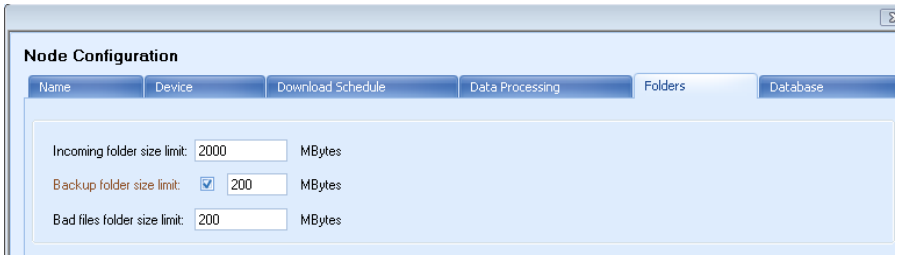
- Limit download time range: **Specifies which files are downloaded that meet a specific date criteria. Enabling this parameter will exclude files that do not fall in the specified time range.**
- Download Order: **The order in which files are downloaded. The default setting is** Oldest First**. The** Newest First **option takes longer on slower networks, therefore we recommend using the default setting on slower networks. If this setting is changed, then you we recommend that you also change the** Parsing order **under the** Data processing **tab**
- File download mode: **This is a factory setting that should not be changed.**

Data Processing



- **The processing order of PQZip data files into a usable format for Investigator software. We strongly recommend the parsing order be consistent with the file download order.**

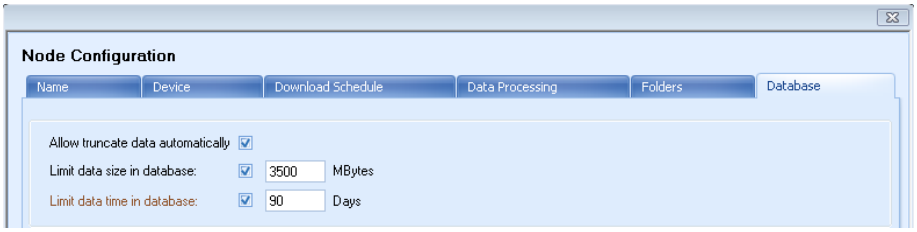
Folders



- Incoming folder size limit: **The size of the temporary folder where the PQZip files are stored while they are waiting to be processed. The default is 2 GB, although this can be changes according to your available system resources. All original PQZip files are deleted after they are processed unless they are backed up.**
- Backup folder size limit: **The size of the backup folder where all good PQZip files can be archived. When the file folder reaches its limit, the oldest files will be deleted first.**

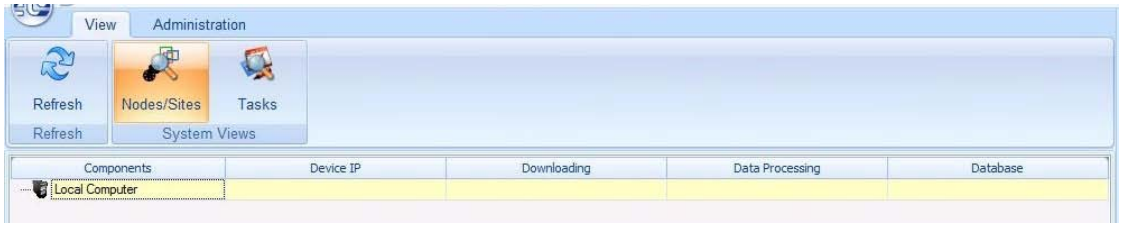
- Bad files folder size limit: **The size of the bad file folder where all bad PQZip files are kept. A file status (good or bad) is determined when the file is processed.**

Database



- Allow truncate data automatically**: Enabling this feature allows the** *Node* **to truncate older data once the database size limit is reached.**
- Limit data size in database: **Enabling this feature limits the amount of data in the database to the specified amount. If this limit is reached and "Auto truncate" is not enabled, then the** *Node* **won't parse any** *Node* **files until data is deleted manually**.
- Limit data time in database: **Enabling this feature limits the amount of data in the database to the specified time duration. If this limit is reached and "Auto truncate" is not enabled, then the** *Node* **won't parse any** *Node* **files until data is deleted manually.**

Node Status



The PQSCADA Management Studio is an interactive tool which provides full control and monitoring of all of PQSCADA's activities. The main PQSCADA Management Studio's window is a hierarchical table/grid with following columns:

- **Components**
- **IP Address**
- **Downloading**
- **Data Processing**
- **Database**

Components

The PQSCADA suite is designed to operate and manage a virtually unlimited number of BLACKBOX devices, both Portable and fixed. The physical device is represented under the system by the term ***Node***.

The ***NODE*** is the software component which represents data taken by a physical device such as BLACKBOX Portable or a fixed G4k model.

The ***SITE*** is a software component which represents a group of ***Nodes***. The SERVER is the representation of the physical machine (Analysis lab) on which the PQSCADA server application is installed

Status	Description	Right Click Menu
The name	**The given name to the *Node***	• **Refresh** • **Rename** • **Configure** • **Delete**
"Needs Upgrade"	**The *Node* requires upgrade. Use *Upgrade* on right mouse click menu.**	• **Refresh** • **Upgrade** • **Delete**

IP Address

z	Description	Right Click Menu
IP Address or host name in hyperlink format	The IP Address is defined.	• Open in Explorer • Open in FTP • IP Setup
"No IP defined"	No IP Address is defined, Link is disabled.	• IP Setup

Downloading

The Downloading field displays the status of the data downloading process. Below are the list of status variations that might be expected in that field.

Status	Description	Right Click Menu
"Disabled" in light gray	The FTP downloading service is disabled.	• Schedule operation • IP Setup • Folders setup • Open incoming folder • Enable
"No IP defined" in light gray	IP address not defined. FTP downloading service is disabled.	• Schedule operation • IP Setup • Folders setup • Open incoming folder • Enable
Error: link failure	No communication IP was set. However, device is not reachable. Check physical connection.	• Refresh • Force connection attempt • Schedule operation • IP Setup • Folders setup • Open in Explorer • Open in FTP • Open incoming folder • Disable
Error: login failure	No communication IP was set. Login failure Use *IP Setup* to verify/modify FTP user name and/or password.	• Refresh • Force connection attempt • Schedule operation • IP Setup • Folders setup • Open in Explorer • Open in FTP • Open incoming folder • Disable

Status	Description	Right Click Menu
"Next attempt in XX seconds"	Waiting for the next communication attempt	• Refresh • Schedule operation • IP Setup • Folders setup • Open in Explorer • Open in FTP • Open incoming folder • Disable
"Checking for new files…"	Communication established, Checking for new files	• Refresh • Force connection attempt • Schedule operation • IP Setup • Folders setup • Open in Explorer • Open in FTP • Open incoming folder • Disable
"XXX kB/sec" in normal color	Downloading new files	• Refresh • Force connection attempt • Schedule operation • IP Setup • Folders setup • Open in Explorer • Open in FTP • Open incoming folder • Disable
Error: Incoming folder full	PQZip folder is full due to folder limitations. Use Folders Setup to modify the Incoming folder quota or free some disk space.	• Refresh • Force connection attempt • Schedule operation • IP Setup • Folders setup • Open in Explorer • Open in FTP • Open incoming folder • Disable
Error: Disk full	PQZip folder is full due to disk space limitations.	• Refresh • Force connection attempt • Schedule operation • IP Setup • Folders setup • Open in Explorer • Open in FTP • Open incoming folder • Disable

Status	Description	Right Click Menu
Error: incoming folder not found	The incoming directory is missing.	• Refresh • Force connection attempt • Schedule operation • IP Setup • Folders setup • Open in Explorer • Open in FTP • Open incoming folder • Disable
Error: cannot write file	Cannot write the downloaded file to disk	• Refresh • Force connection attempt • Schedule operation • IP Setup • Folders setup • Open in Explorer • Open in FTP • Open incoming folder • Disable

Data Processing

The Data Processing field displays the status of the PQZip data processing engine. Below are a list of status variations that might be expected in that field.

Status	Description	Right Click Menu
"Disabled" in light gray color	The service is disabled.	• Folders setup • Define 'time of interest' interval • Configure service • Open incoming folder • Open 'bad files' folder • Open data backup folder • Enable
"Processing stage 1 of 2"	Stage 1 (PQZip parsing)	• Refresh • Force file parse attempt • Folders setup • Define 'time of interest' interval • Show/ modify data channels configurations • Configure service • Open incoming folder • Open 'bad files' folder • Open data backup folder • Disable • Recalculate data
"Processing stage 2 of 2" in normal colors	Stage 2 (Recalculate summaries)	• Refresh • Force file parse attempt • Folders setup • Define 'time of interest' interval • Show/ modify data channels configurations • Configure service • Open incoming folder • Open 'bad files' folder • Open data backup folder • Disable • Recalculate data
Database error	Database is full or unavailable	• Refresh • Force file parse attempt • Folders setup • Define 'time of interest' interval • Configure service • Open incoming folder • Open 'bad files' folder • Open data backup folder • Disable • Recalculate data

Status	Description	Right Click Menu
"Waiting for new data"	Idle, no new data found in Incoming folder	• Refresh • Force file parse attempt • Folders setup • Define 'time of interest' interval • Show/ modify data channels configurations • Configure service • Open incoming folder • Open 'bad files' folder • Open data backup folder • Disable • Show last day log • Recalculate data
Bad files folder is full	"Bad files" folder is full.	• Refresh • Folders setup • Define 'time of interest' interval • Configure service • Open incoming folder • Open 'bad files' folder • Open data backup folder • Disable • Show last day log • Recalculate data

Database

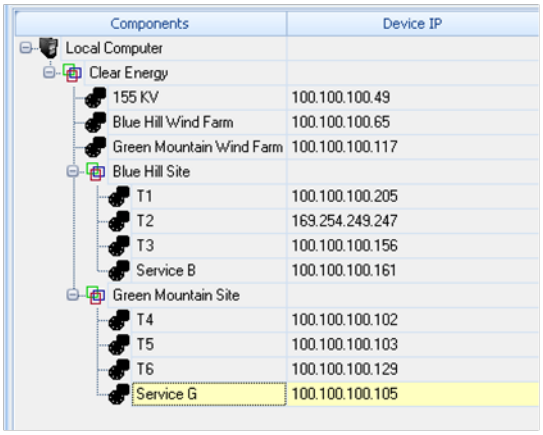
The Database field displays the status of the ***Node**'s* database. Below are a list of status variations that might be expected in that field.

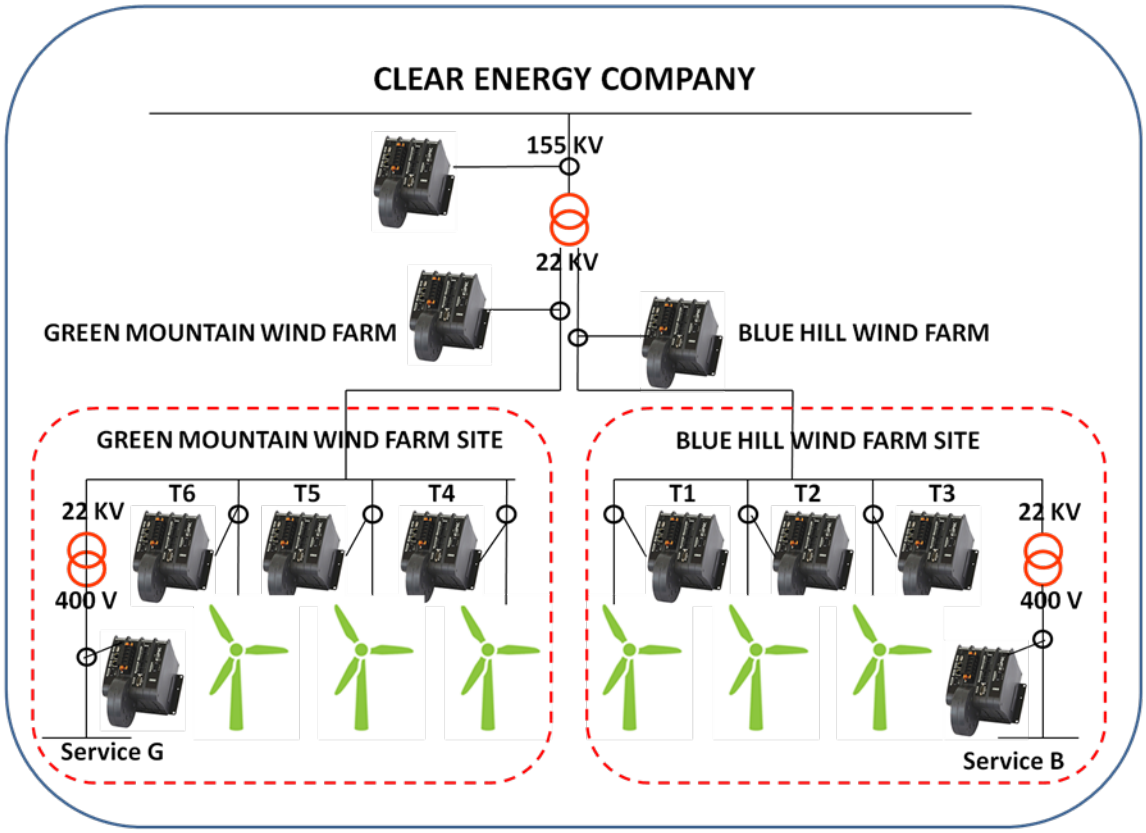
Status	Description	Right Click Menu
Login Error	Login Error. The administrative access to the database was denied. Please select Login setup option on right mouse click menu.	• Login setup
Database is full	Database is full. The database size has reached its maximum state. Please resolve that issue on Size limitation setup, free more disk space or truncate unnecessary data.	• Refresh • Login setup • Size limitation setup
XXX MB / YYY MB	Online	• Refresh • Login setup • Size limitation setup • Backup • Restore • Delete data • Re-index • Import data • Export data

Hierarchical Site Construction

The PQSCADA software offers a user friendly hierarchical ***Site*** construction view. A very large ***Site*** (Clear Energy Company in our example) can be broken down into smaller sub-***Sites*** (Green Mountain and Blue Hill Wind Farms). In each ***Sub-Site***, it is possible to create S***ub-Nodes*** (T1-T6, Service B, and Service G). In this way, the structure and GUI of the Main viewing area in PQSCADA most accurately represent the actual electrical grid architecture.

The PQSCADA Hierarchical *Site* Construction



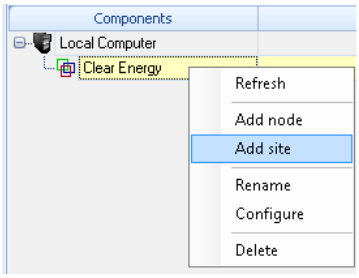


Managing Sites and Nodes

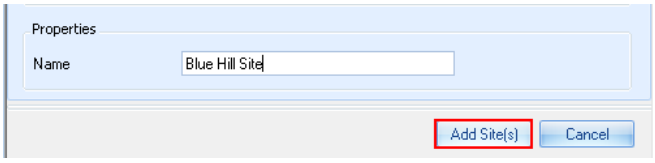
Sites within Sites

A large ***Site*** can be broken down into smaller sub-***Sites***. In this way, there is a greater visual clarification of the electrical system architecture. As in the Clear Energy ***Site***, we have two sub-***Sites*** (wind farms) called Green Mountain and Blue Hill. The process is similar to **Adding a Site on page 31,** except you add the ***Site*** to an existing ***Site*** not to the **Local Computer**.

To add *Sites* within *Sites*:

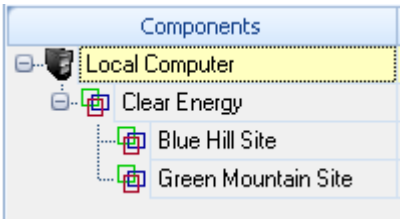


1. From the main menu, right click **Clear Energy** (not Local Computer). Then select **Add Site(s)**



2. Enter the ***Site*** Name (Blue Hill Site in our example), then click **Add Site.** In our example, we also add the Green Mountain Site.

The following window shows two new ***Sub-Sites*** **Blue Hill** and **Green Mountain** that are part of the **Clear Energy Site**.



There are now two ***Sites*** within one large ***Site***. Now it is possible to add ***Nodes*** to both the main ***Site*** (**Clear Energy** and the ***Sub-Sites*** **Blue Hill** and **Green Mountain)**

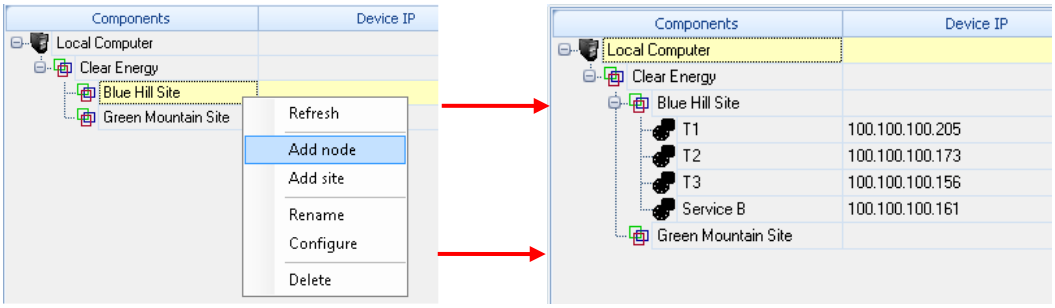
Adding *Nodes*

You can add ***Nodes*** to the main ***Site*** (Clear Energy) or to the sub-***Sites*** (Blue Hill and Green Mountain. The process is the same as Adding a ***Node*** (please refer to **Adding a New Node on page 37**.)

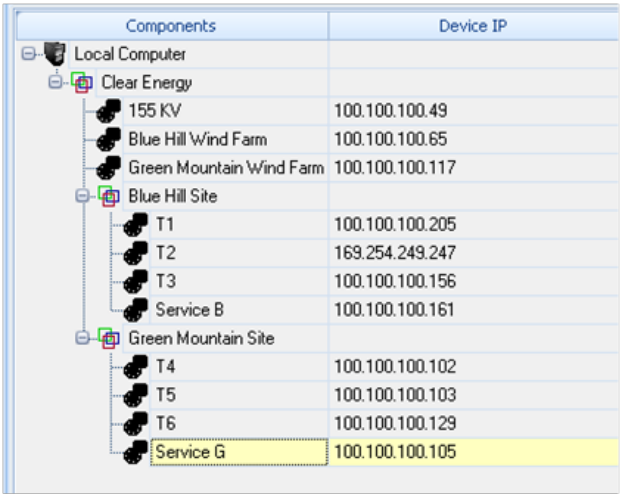
To add Sub-Nodes under Sub-Sites:

- **Right click the** Blue Hill *Site* **(not local computer), then add** *Nodes* T1, T2, T3, and Service B.

You see below on the right the new ***Nodes*** created for **Blue Hill Site**.



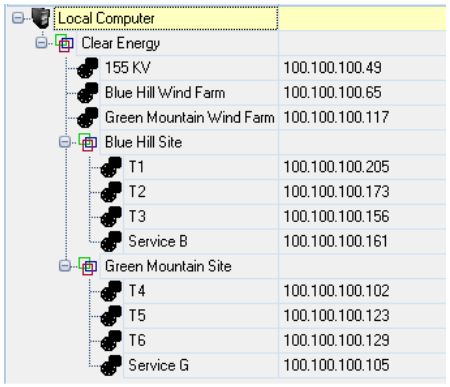
In our example, we also created ***Nodes*** for the Clear Energy ***Site*** and the Green Mountain sub-***Site*** for illustration purposes.



In the screen above, it is clear to view the hierarchical structure of the Site with sub-Sites and Nodes built both under the main Site and the sub-Sites. The following section discusses how to move Sites and Nodes.

Moving Nodes and Sites

The PQSCADA allows you to change the logical location of ***Nodes*** and ***Sites*** with drag and drop convenience, to parallel a physical change. It is possible to move entire ***Sites*** underneath other ***Sites*** as well as moving individual ***Nodes*** to other ***Sites*** as well as other ***Nodes***.



In order to move *Sites*/*Nodes*, you must first unlock the components.

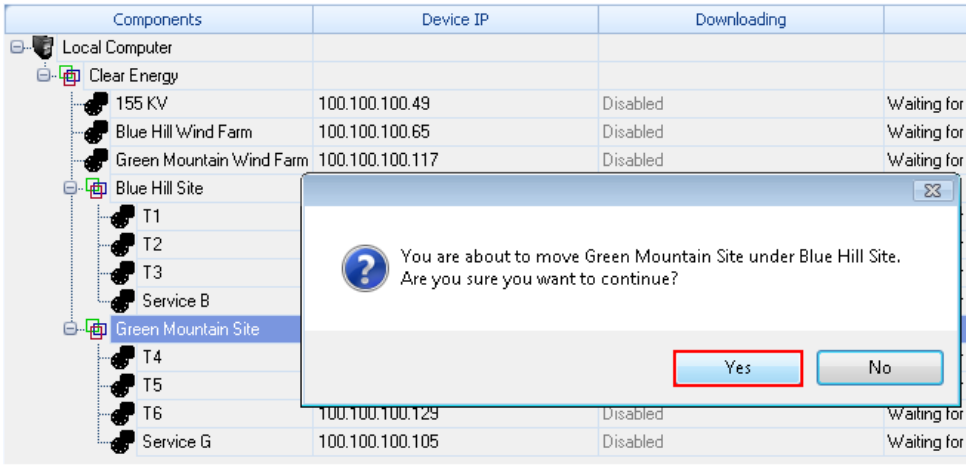
To unlock the components:

- **From the** Administration **Tool bar, click** Locked.

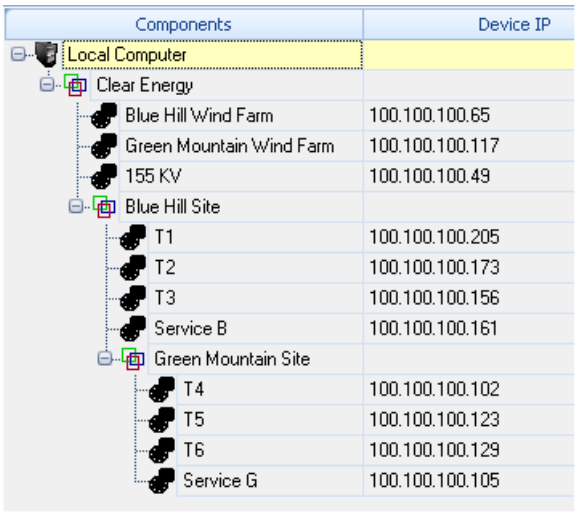
This will unlock the Structure of the ***Sites*** and ***Nodes*** and allow you to change their position.

To Move *Sites*:

- **To change the position, drag and drop the** Green Mountain Site, **then place it underneath the** Blue Hill Site**. then click** Yes **to continue.**



The entire **Green Mountain Site** is now re-positioned with all attached ***Nodes*** underneath the **Blue Hill Site**.

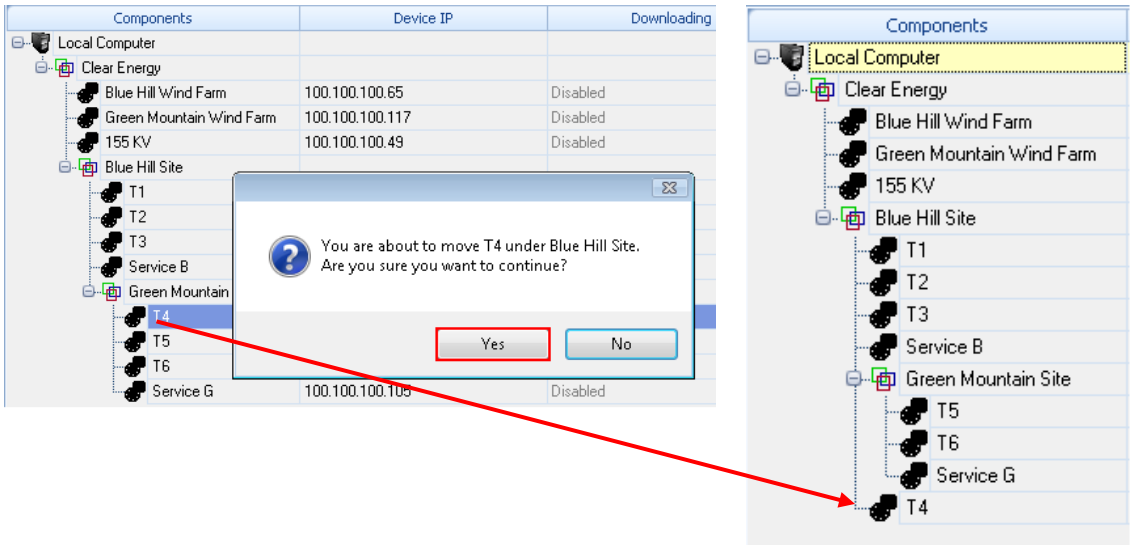


You can also re-position ***Nodes*** to other ***Sites*** and to be placed under other ***Nodes***.

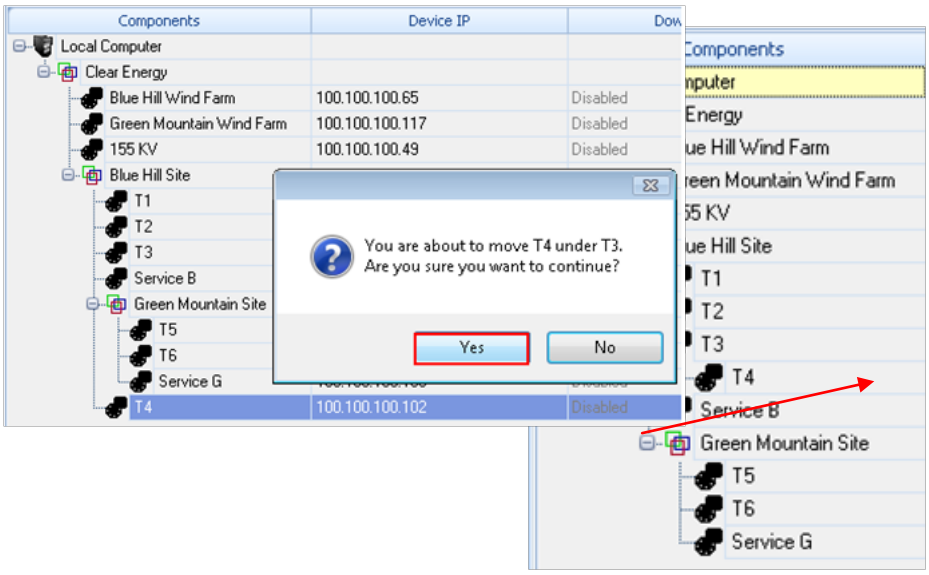
To move *Nodes*:

- **To change the position of a** *Node* **(T4 for example), drag and drop the** *Node* **to the new location (Blue Hill** *Site***), then click** Yes **to continue.**

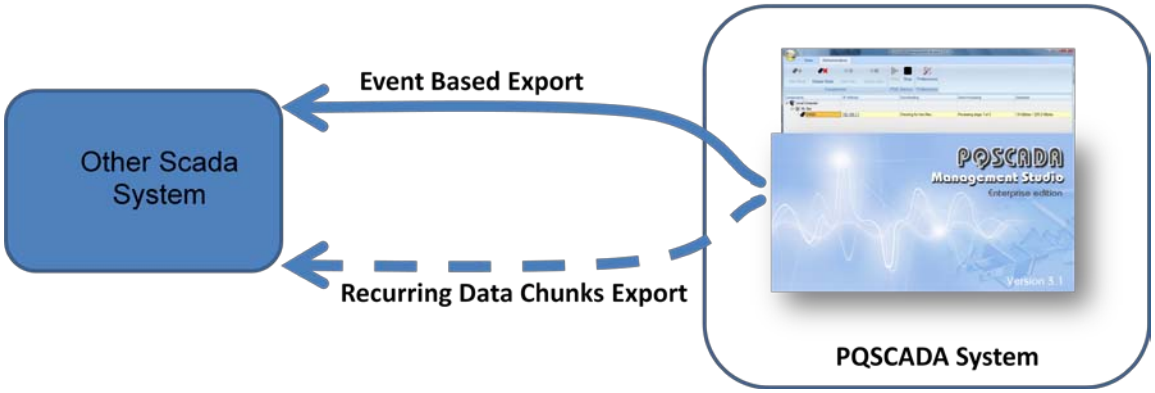
Node T4 appears under the Blue Hill *Site*



It is also possible to move *Nodes* **beneath other** *Nodes***. In the example below we have repositioned** Node T4 **underneath** Node T3.



Interoperability and Compatibility with Other SCADAs and Vendors



PQSCADA allows interfacing with other SCADA systems, through the automatic exporting of all its parameters in standard formats such as COMTRADE and PQDif. This feature may be easily implemented by using the ***Tasks*** feature.

For example, if the user requires to be notified (receive an event) every time a parameter exceeds its predefined limits, then a ***Task*** may be created in order to export any data relevant to that specific event in either COMTRADE or PQDif format. The data will be sent to a specific location where it will be intercepted by the user's SCADA and processed as any other information in the user's system. By implementing this feature, the user is able to harness all the power of the BLACKBOX system and benefit from its strengths and advantages while working with his legacy system.

This feature also allows the implementation of the BLACKBOX as a DFR (Digital Fault Recorder).

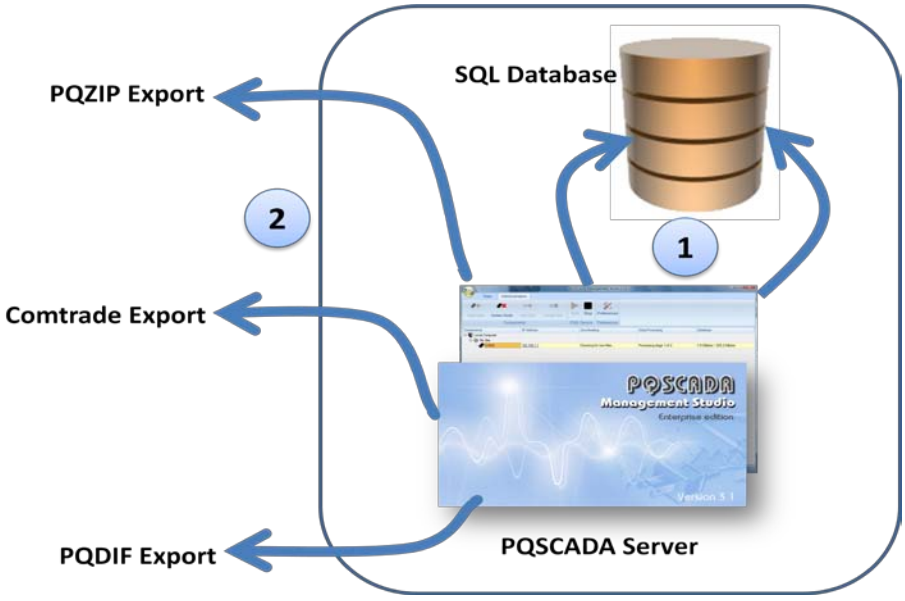
Should the user be interested in continuous data which the PQSCADA is logging in the PQZip compression format at a very high resolution, another task may be set up to periodically export this data in COMTRADE or PQDif format to a location that the user's SCADA can intercept and store or process.

The data export feature of PQSCADA is quite simple, as well as flexible, allowing exporting in lower resolutions of specific parameters (user selectable) in order to allow better management of storage capacity.

Exporting Data

Overview

A variety of simulation, measurement, and analysis tools for power quality engineers are now available from many vendors. Generally, the data created, measured, and analyzed by these tools are incompatible between vendors. Therefore, there is a need for a standard format which is universally compatible. Comtrade and PQDIf are universally acceptable file formats. We support exporting both of these standards in addition to our own proprietary PQZIP format. PQDIF and Comtrade files can be viewed with the standard viewers such as TOP or PQView, while PQZIP files are seamlessly parsed with the PQSCADA software for viewing with **Investigator.**



Users that own SCADA systems that are working with the Comtrade standard can incorporate Elpec's system by configuration of the scheduled tasks in the PQSCADA. Elspec's PQSCADA can be configured to regularly provide data for each of the many parameters it measures or calculates in Comtrade format files.

These files may be compiled event based or periodically for any predefined time span. By interfacing between the customer's SCADA and Elspec's PQSCADA, this information can be made available to the customer in the usually received, to be displayed, backed up or used in further processes.

1. The data is organized by the PQSCADA and stored in the SQL Database Server for quick access. A variety of electrical parameters and parameter statistics are calculated based on the raw PQZip data.
2. The processed data can be exported as a compressed PQZIP file. Also, the data can be exported as a **PQDIF** or **Comtrade** file format for viewing with generic viewer such as PQVIEW or TOP.

PQDif is a format that enables the user to store power quality data.

The data is usually sampled data (Waveforms) or sampled data that was processed (Parameters, RMS, or THD)

There is a difference when exporting Waveforms and Parameters. While Waveforms are treated as events other Parameters are treated as long-term data.

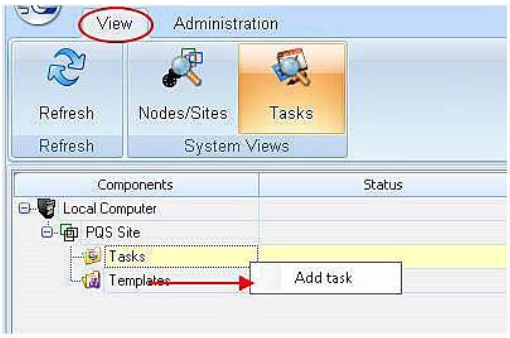
Data in PQDif is stored in observation records. Each observation is a set of graphs that correspond to a specific time period.

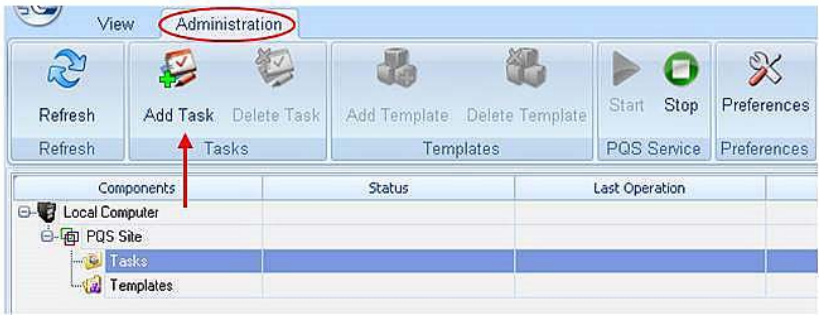
It is NOT possible to mix both Waveforms and Parameters in a single observation. A waveform observation must have a trigger attribute attached to it while other parameters observation shouldn't have any trigger attachment to it.

Tasks

Tasks are pre-defined functions that allow you to set regularly scheduled exports and/or reports according to a specified event or time trigger (monthly, daily, weekly, and fixed). A task operates within a ***Site*** or on components that are attached to a ***Site***. Some tasks require the use of a template to define the specific parameters of the task. (See **Templates on page 72**) Each task can have multiple templates.

As with most PQSCADA components, you may access the ***Tasks*** through either the View or Administrative console. The default is View mode. You must first select **Tasks** in View Mode before switching to Administration mode in order to access the Task/Template components.



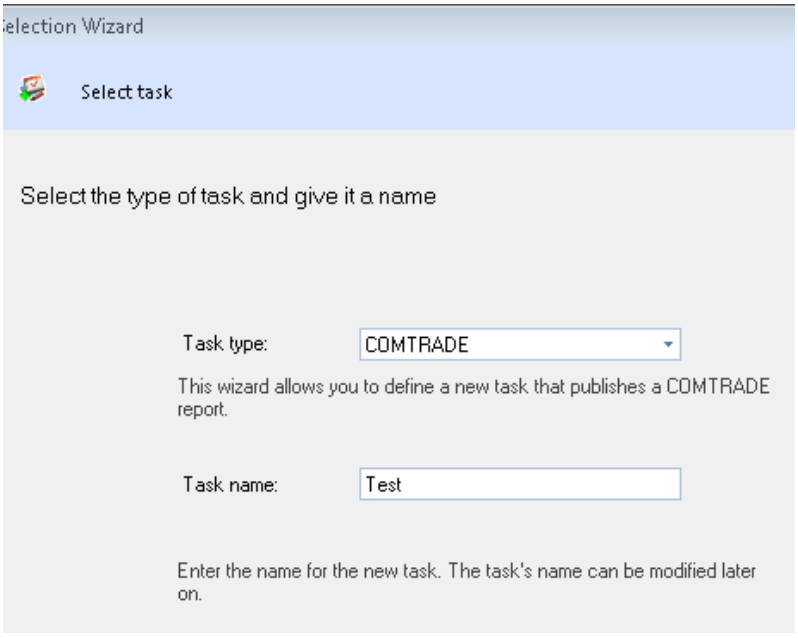


Adding a Task

To add a task:

1. Right click **Tasks** or select **Add Task** from the Administration tool bar.

The **Select task** window appears.



2. Choose **Task type** from the drop down menu.

In our example, we choose **COMTRADE**. There are three types of Task classifications based upon the file type

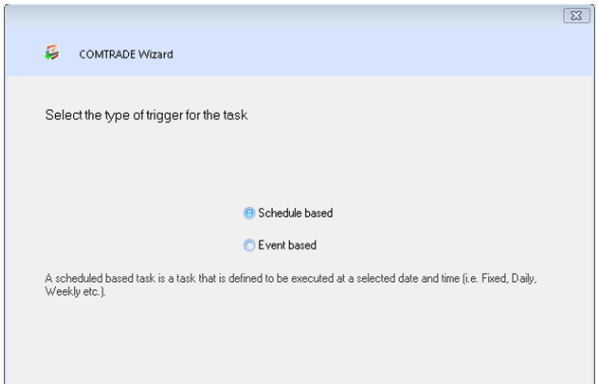
The header of each of the following screen captures reflects the Task type selected.

- **COMTRADE:**
- **PQDIF**
- **PQZIP**

3. Enter a user defined **Task name. (Test** in our example)
4. Click **Next** when complete.

The Trigger selection window appears

The trigger selection window will not appear for PQZIP Tasks because they are exclusively schedule based.



5. Select either **Schedule based** or **Event based** trigger type, then click **Next** to continue (Schedule based in our example).
   - Schedule based: **the task is launched according to a fixed or recurring time schedule.**

- Event based**: the task is launched according to an occurrence of a specific event as defined by the template (see** Templates on page 72**)**

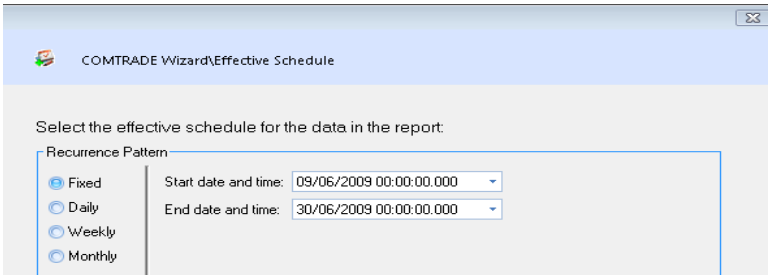
The time schedule window appears only if you selected **Schedule based.** This allows you to set the effective schedule for the data according to Fixed, Daily, Weekly, or Monthly schedules as described.

If you select Event based, then the time based windows do not appear and you proceed directly to the next section.

Once the Trigger type is selected, it cannot be changed.

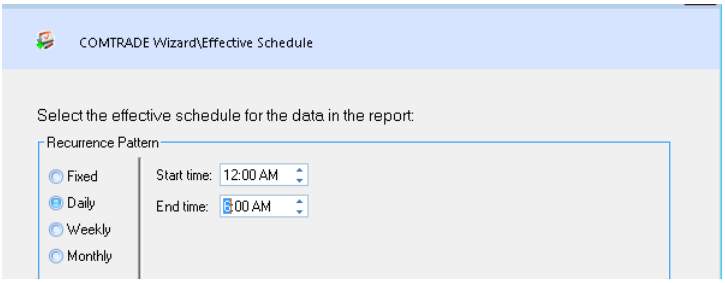
Fixed

The data schedule is set as a single (non-recurring) for a defined time range.



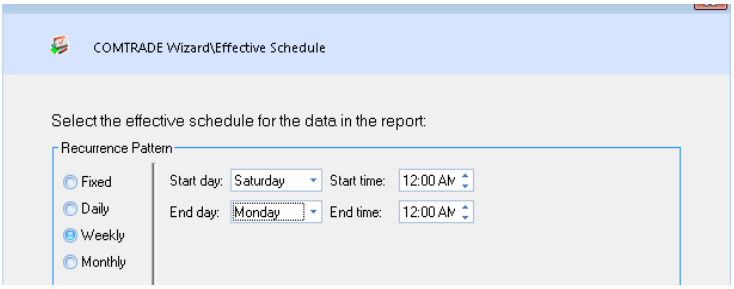
Daily

The data schedule is set as recurring for a defined time range every day.

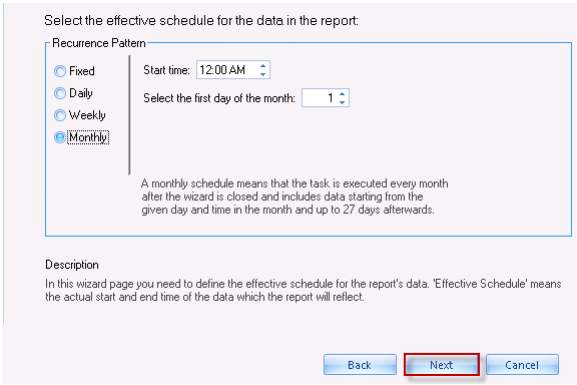


Weekly

The data schedule is set as recurring for a defined time range every week.



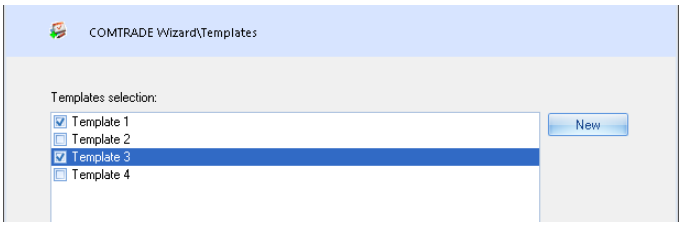
Monthly



The data schedule is set to begin on the defined day and run for up to 27 days following.

6. Select the desired data schedule for the report, then click **Next** to continue.

The Templates wizard appears.



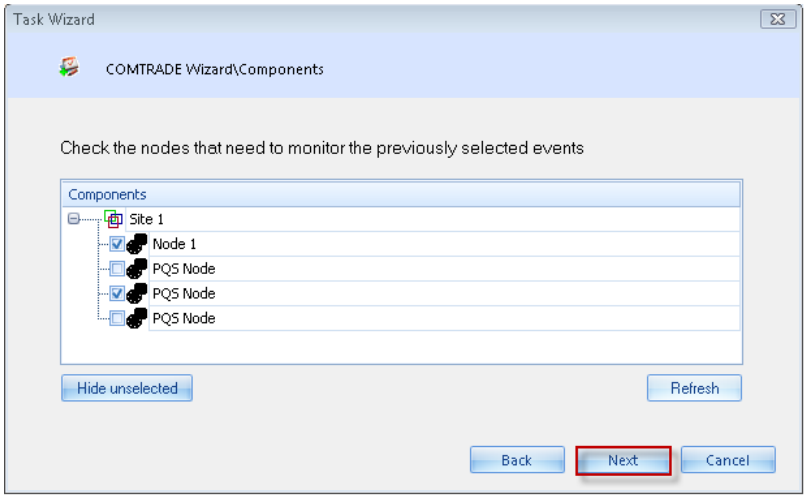
7. Select an existing Template(s) (Template 1 and Template 3 in our example) if one exists or select **New** to add a new template.
8. Click **Next** to continue adding a task.

Some tasks require the use of a template to define the specific parameters of the task. For example: A task that needs to record a voltage dip event, providing both the RMS Voltage and Frequency values during the event , the template is the place where the user defines the desired values

The templates window will not appear for PQZIP tasks; therefore you can proceed to **Node Selection on page 67.** *If a new template is required; please continue with* **Adding a Template on page 72.** *Once a new template is added, you can resume at* **Node Selection on page 67.**

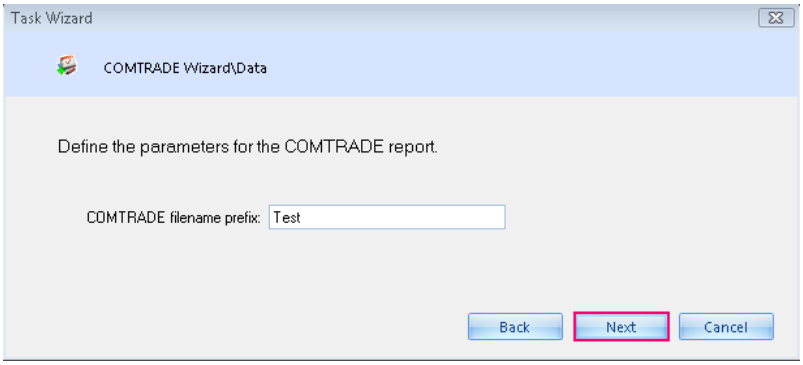
Node Selection

The **Node Selection** window appears.



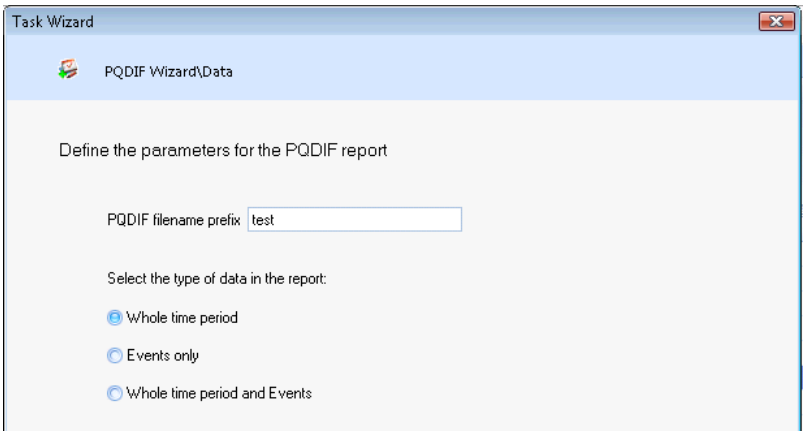
9. Select the desired ***Node***(s), then click **Next**

By choosing multiple nodes, the task is performed on each of the selected nodes.



The screen above only appears for Comtrade file export tasks.

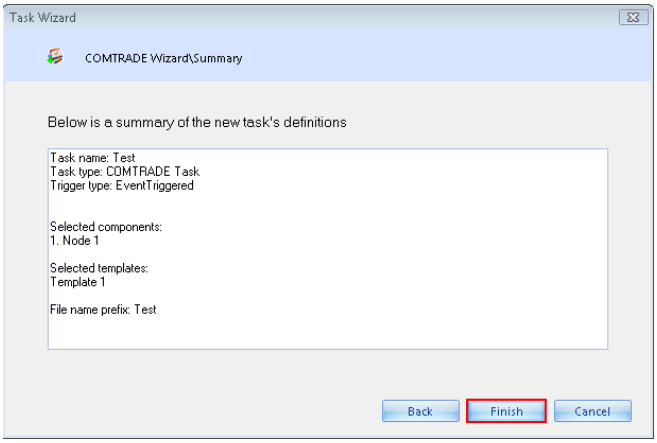
If a **PQDIF** file is to be exported, the following screen appears.



When exporting data to a PQDif file , the parameters exported depend on the parameters in the selected template and the user selection at the end of the PQDif wizard.

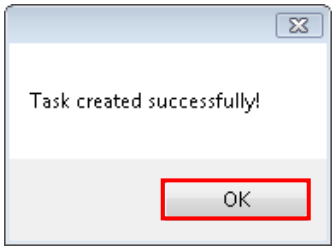
- *If events only is selected then graphs will be generated for all the events in the triggered duration. The graphs will contain Waveforms only. If the attached template has waveform graphs then these waveform graphs will be generated. If the template doesn't have any waveforms then all of the waveform graphs will be generated.*
- *If whole time period is selected, then the graphs will be generated for the relevant time period. The generated graphs will include graphs for all the template selected parameters except waveforms.*
- *If whole time period and events is selected, then graphs containing waveforms only will be generated for all the events (in the relevant time period) and graphs containing all the parameters in the template except waveforms will be generated for the whole time period.*

10. Enter a user defined filename prefix, then click **Next.**
11. The summary window appears with all of the task definitions.



12. Click **Finish** to continue.

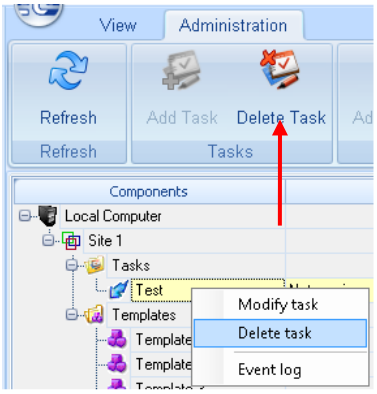
A successful task completion verification window appears.



13. Click **OK** to complete.

This completes the **Adding a Task** process. The following screen appears showing the newly created **Task** called **Test** in the main viewing area. Also note the current status of the task displayed below.

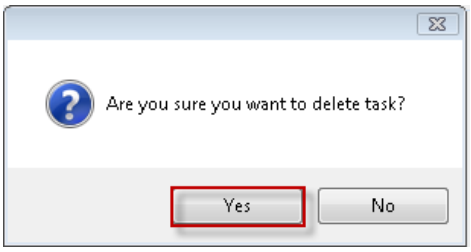
Deleting a Task



To delete a task:

1. From the main menu, right click the task or select **Delete task** from the Components area.

The confirmation window appears.



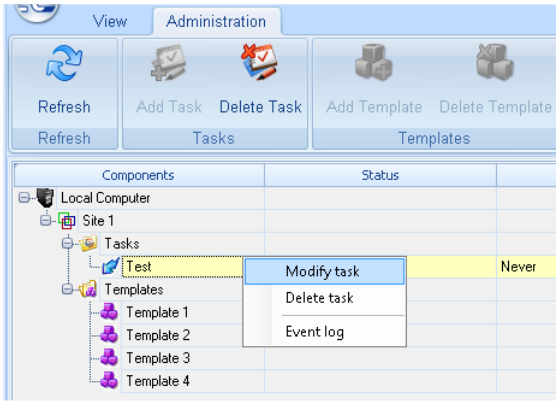
2. Click **Yes** to confirm.

Modifying a Task

The procedure to modify a task is similar to **Adding a Task**.

To modify a task

- **From the main menu, double click the task or select** Modify task **by right clicking.**

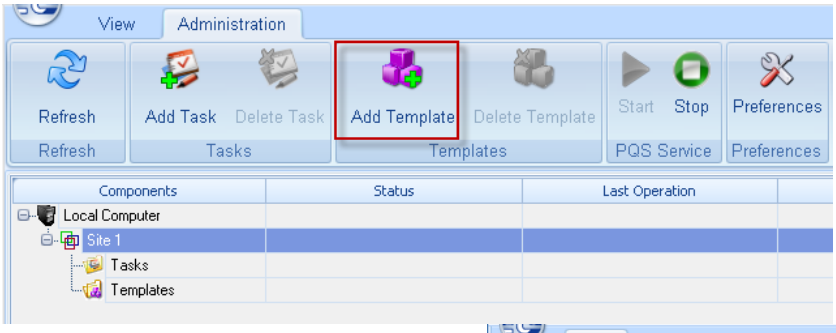

View
Administration
Refresh
Add Task
Delete Task
Add Template
Delete Template
Refresh
Tasks
Templates
Components
Status
Local Computer
Site 1
Tasks
Test
Never
Templates
Template 1
Template 2
Template 3
Template 4
Modify task
Delete task
Event log

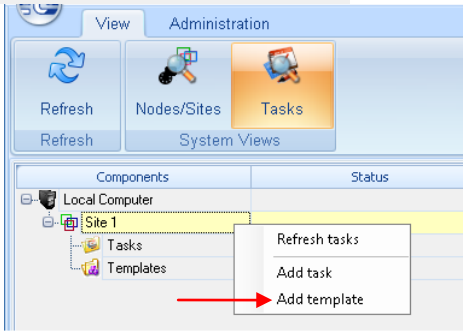
Templates

Templates are used to define the Events, Parameters, and Configurations for utilization by different tasks. By using templates, you can save the time of redefining all variables across multiple tasks. A single template can serve multiple tasks.

Adding a Template

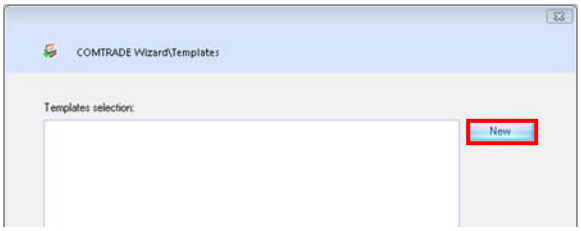
To add a template:





1. From the main window right click the Site name or select **Add Template** from the Administration view.

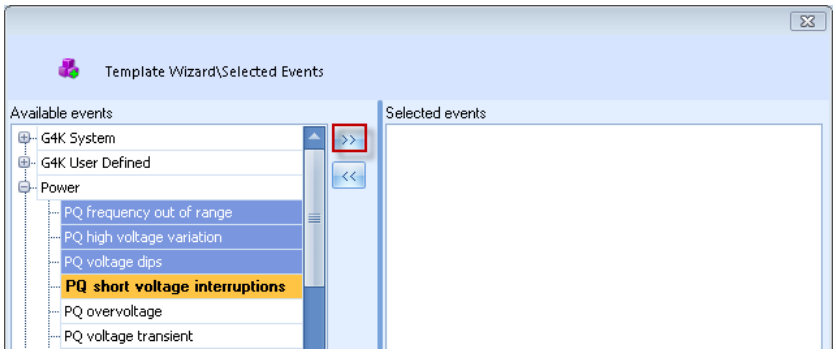
If you are adding a Template from the Task procedure, the following screen appears.



The Template name window appears.

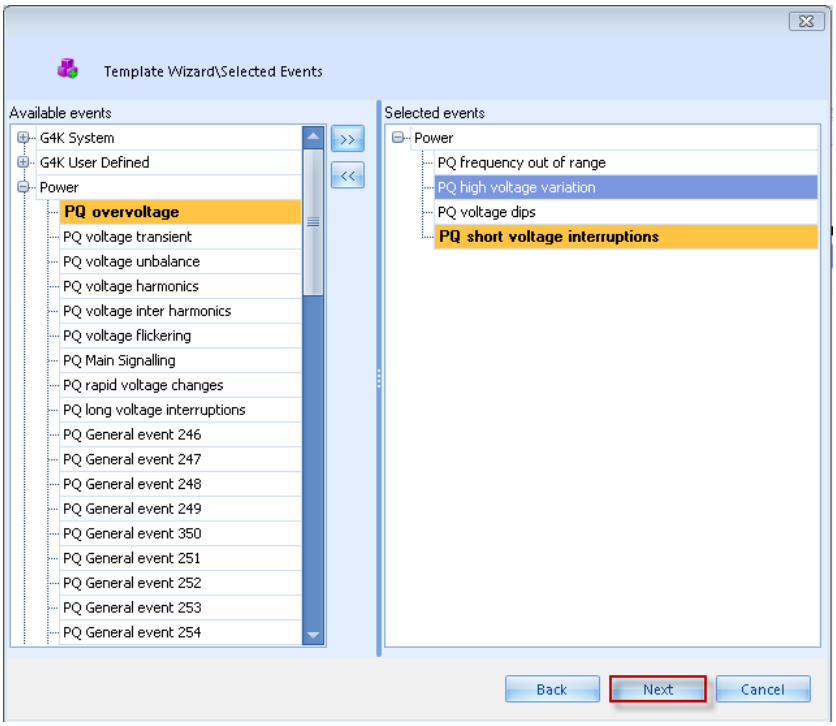
2. Enter a user defined name for the template (Template1 in our example), then click **Next.**

The Template events window appears.



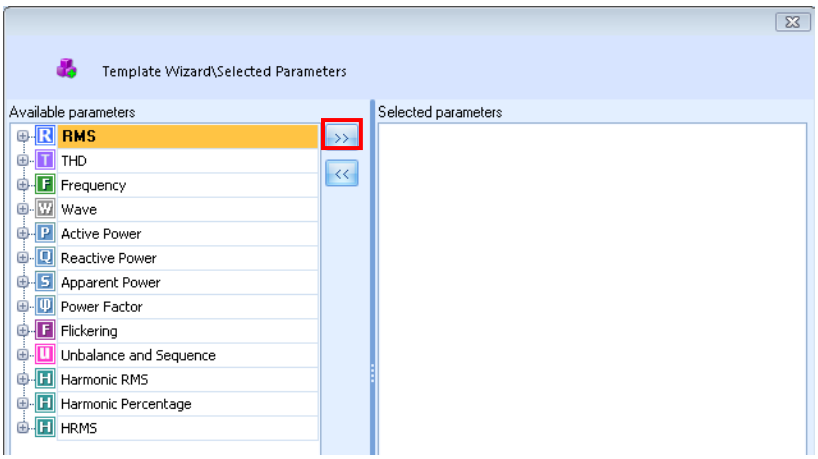
3. Select an event(s) from drop down list of **Available Events**, then click the middle cursor button to move the selection(s) to **Selected events**.

A new window appears with all selected events on the right side.

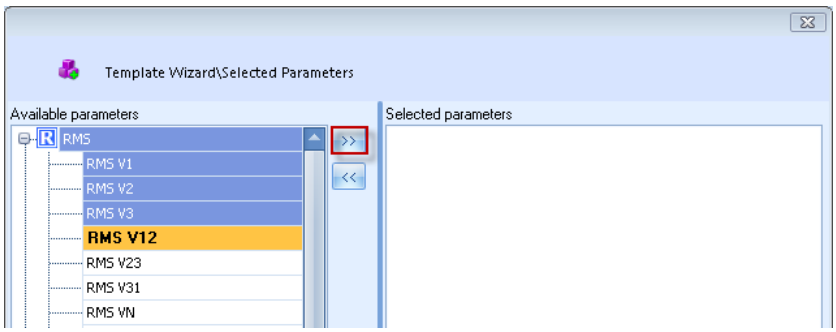


4. Click **Next** to continue.

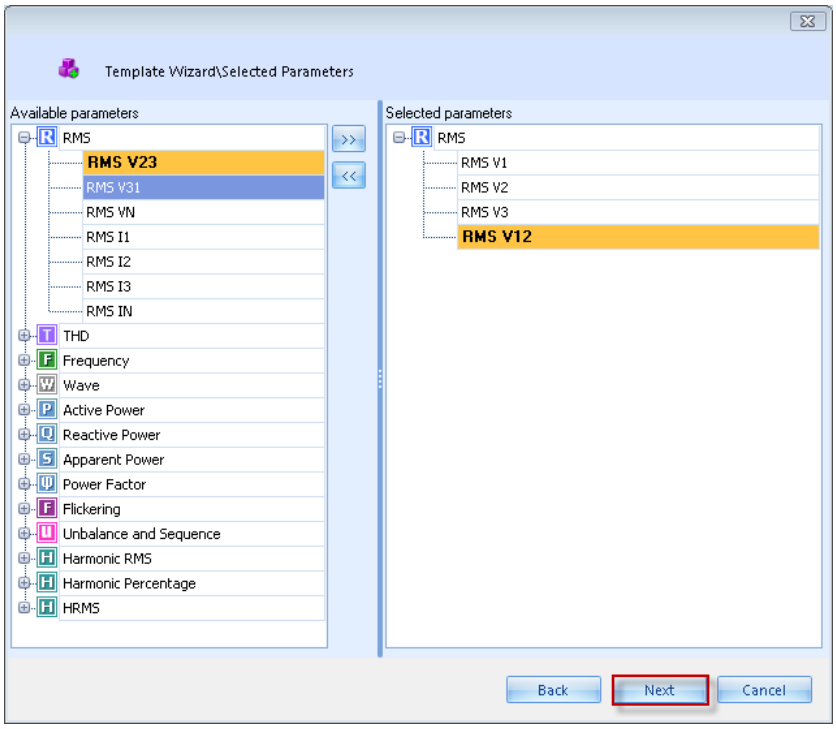
The **Parameter selection** window appears.



5. Select all **Desired Parameters** from the Available parameters list on the left, then click the middle cursor button to move the items to the **Selected parameters** on the right.



The selected parameters appear in the **Selected Parameters** window.

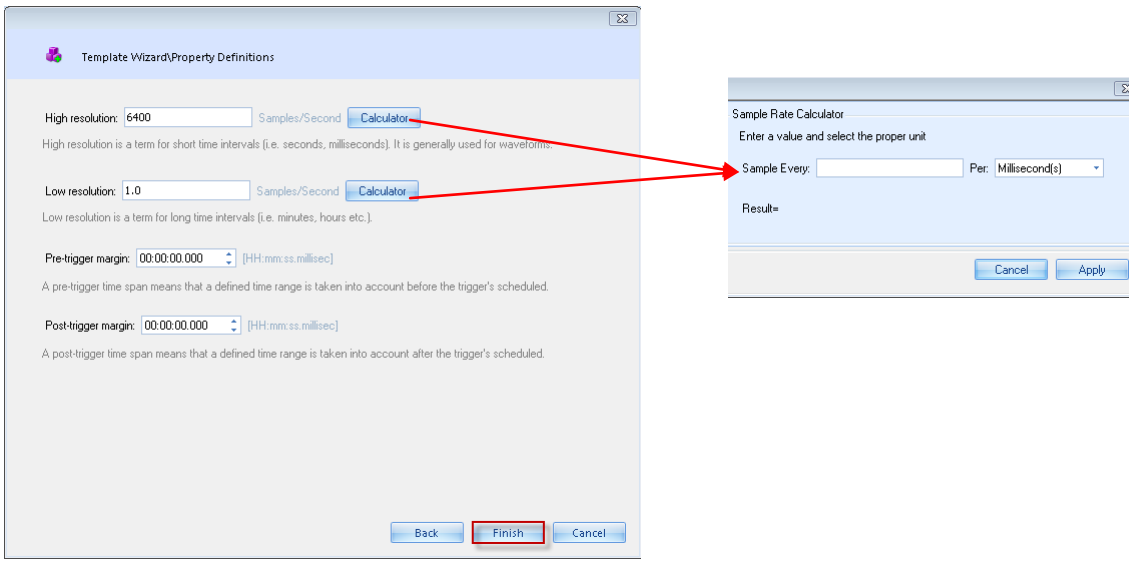


6. Click **Next** to continue.

The Property Definitions window appears. Here you will define the configuration parameters for all events.

Some of the parameters are changing rapidly in a given time unit while others change less often. Therefore we need to provide those parameters that change frequently with a higher resolution, hence the “High resolution” definition. The parameters which change less often in a given time unit may be represented with a lower resolution, hence the “Low resolution” parameter.

Which parameters will be represented in High Resolution and which in Low Resolution are preset in the PQSCADA manager.

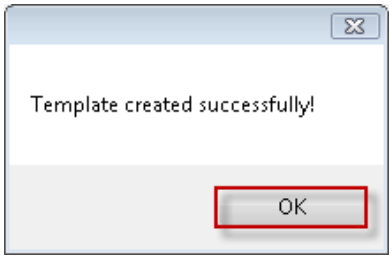


7. Define all Property Definitions.

- High resolution: **Primarily used for short time intervals (waveforms). In our example we use 6400 which is calculated from 50Hz * 128 samples per cycle.**
- Low resolution: **Primarily used for longer time intervals (minutes, seconds). In our example we select** 1.0 **update per second rate.**
- Pre-Trigger margin: **An additional time period (margin) is taken before the trigger is scheduled.**
- Post-Trigger margin: **An additional time period (margin) is taken after the trigger is scheduled.**

8. Click **Finish** to complete the process.

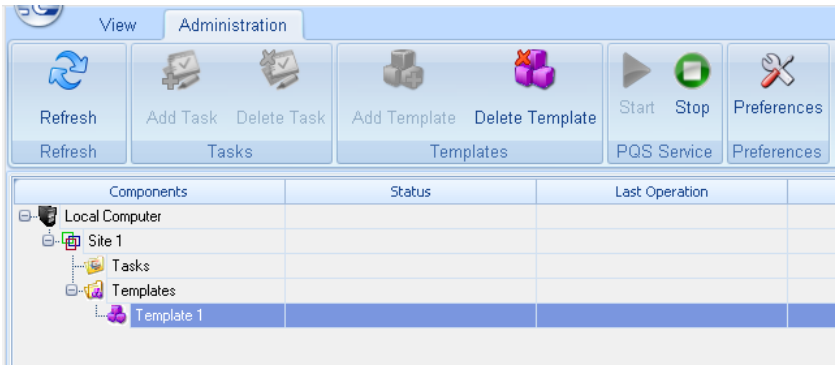
   The verification window appears.



9. Click **OK** to complete.

If you need to continue adding a task, please return to **Node Selection on page 67.**

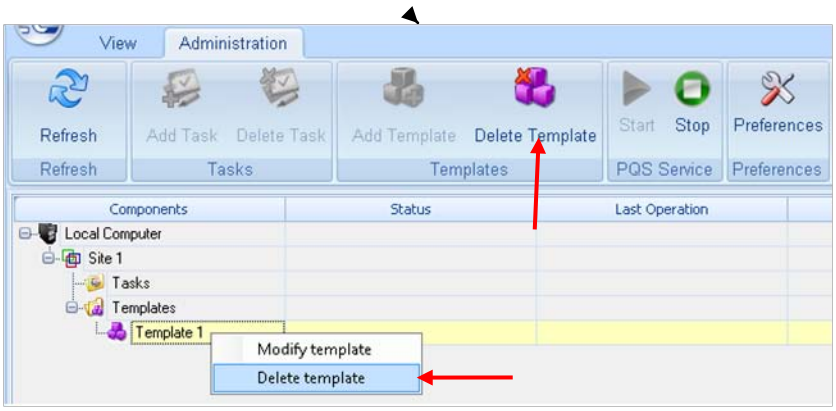
Else, if you are adding a new template without adding a task, then you can see a new template called **Template 1** is created as shown in the window below.



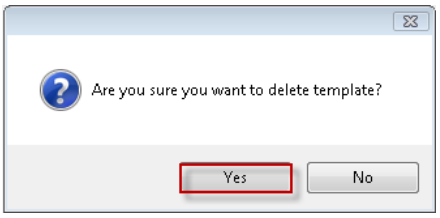
Deleting a Template

To delete a template:

1. From the main menu, right click the template or select **Delete Template** from the Components area.



The confirmation window appears.

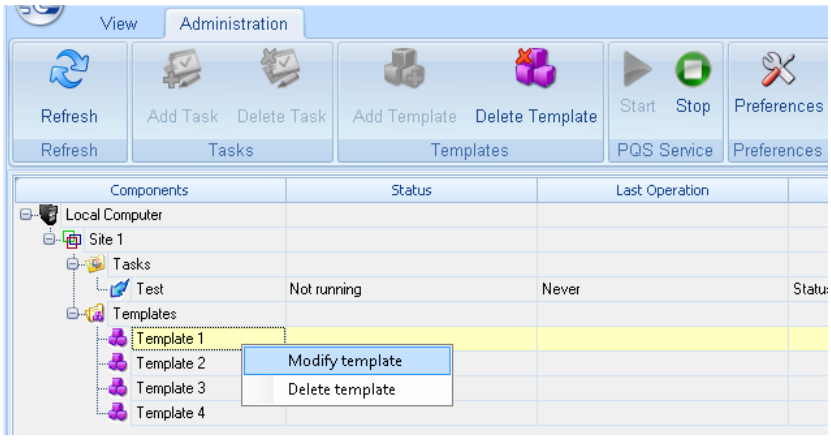


2. Click **Yes** to confirm.

Modifying a Template

To modify a template:

- **From the main menu, double click the Template or select** Modify template **by right clicking.**



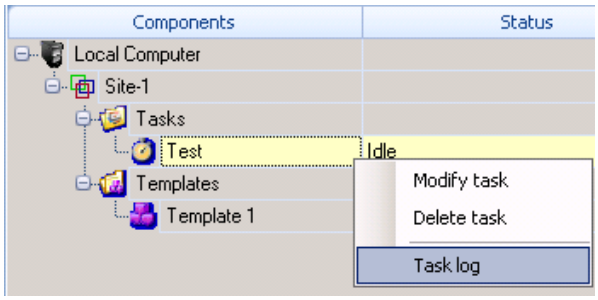
Locating Exported Data

The files are exported during the *task* process. For specific details on the different methods to export a file see Tasks on page 61

The procedure for locating exported data files from PQSCADA is common between all file types.

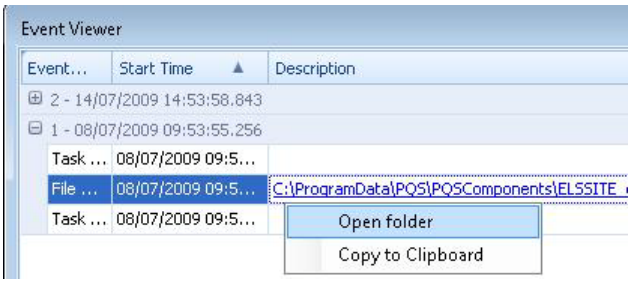
To locate the exported files:

1. From the main viewing area, right click the Task (**Test** in our example)



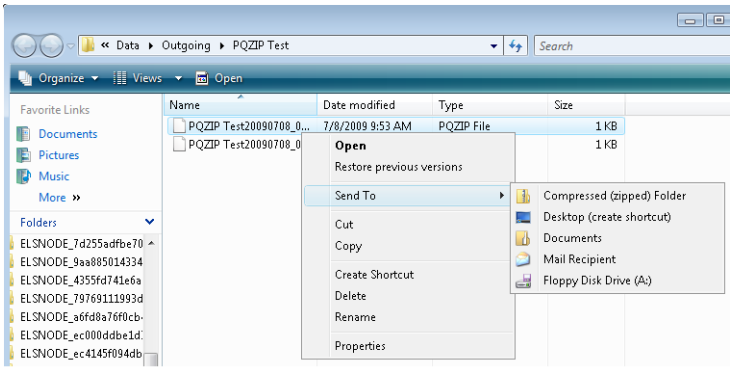
2. Click **Task log.**

The Event Viewer screen appears.



3. Right click the folder to be exported, then select **Open folder**.

   The Files appear in the window.



The files are now ready for transferring to a different location or viewing in another application.

Viewing Data

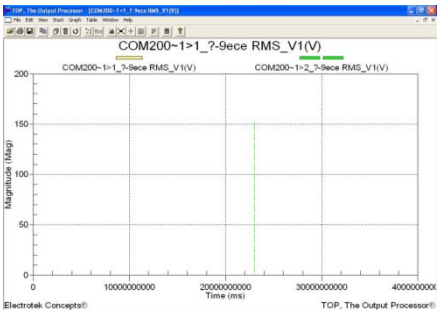
The viewing of exported files is dependent on the file type.

- Comtrade files: **Universally compatible file format can be viewed with PQview or TOP.**
- PQDIF files: **Universally compatible file that can be viewed with PQview.**
- PQZIP files**: Can be viewed with Elspec's proprietary Investigator application.**

COMTRADE Files

(Common Format for Transient Data Exchange) is an important IEEE standard (C37.111) developed explicitly for the power industry. The standard defines a common format for data files used for the interchange of various types of fault, test or simulation data for electrical power systems. Although widely recognized, this file format is limited and does not allow for data compression.

The Comtrade file is exported from the Outgoing data folder of the PQSCADA. however it cannot be read by the PQSCADA software. Comtrade files can be viewed using different applications (**TOP** in our example)

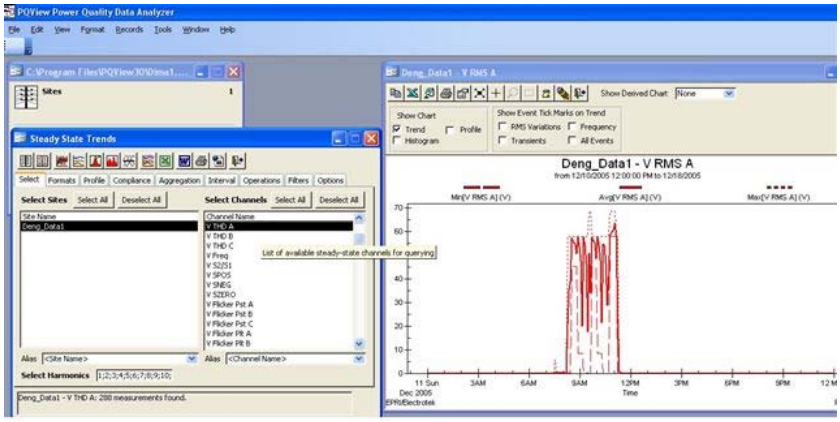


PQDIF Files

Power Quality Data Interchange Format is a non-proprietary and flexible means of exchanging power quality data between different metering devices and software. Developed under the guidelines of IEEE P1159.3, PQDIF provides a common ground where different vendors can export to or import from, using a data format consistent with the defined PQDIF standard. Although widely recognized, this file format is limited.

Much like a Comtrade file, The PQDIF file is exported from the Outgoing data folder of the PQSCADA; however it cannot be read by the PQSCADA

software. PQDIF files can be viewed using different applications as in **TOP** or **PQVIEW** in our example.



PQZIP Files

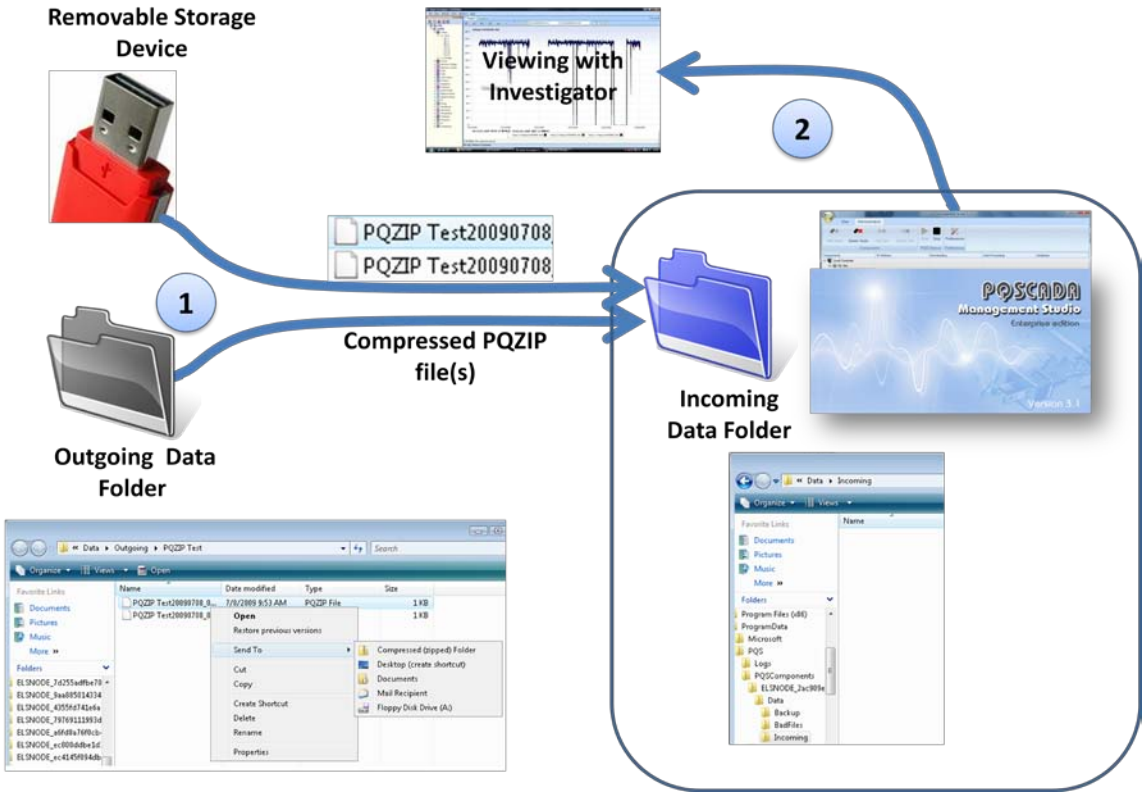
PQZIP is a patented Elspec compression technology that enables continuous gap-less recording of all electrical parameter related data for significant time duration without the need of event thresholds of any kind. PQZip compression technology is based on the Lossy Compression Method which is protected under US Federal Patent Law as well as by patent laws in many other countries. Exporting the files in our own patented format allows for all data to be transferred in a compressed format. Exporting to PQZIP files allow for easy backup of large amounts of data or easy transfers (i.e. via emails) of data between users of different PQSCADA systems.

In order to view PQZIP files, the files need to be imported into a PQSCADA application.

Importing Data into PQSCADA

PQZip files are automatically downloaded from the BLACKBOX unit into the PQSCADA server. In addition, you may also manually retrieve the files and is often performed in the following common scenarios.

- Second Opinion**: Sometimes analysis of PQZip files may be required at a secondary location for consulting purposes. In this case, the PQZip files are exported from the original PQSCADA and then transferred to a secondary location, into a PQSCADA server, to be further analyzed.**
- Remote Site**: At some remote sites, BLACKBOX units are installed without the PQSCADA server to download the PQZip files. In these cases, the PQZip files need to be extracted from the BLACBOX units into a portable media device and then imported into a PQSCADA server for analysis.**



1 The PQZIP files are imported from an external source (the Outgoing Data Folder of the original PQSCADA, portable media device, or email) to the Incoming data folder of a virtual ***Node*** of the recipient (for more on virtual nodes see Creating a Virtual Node on page 83).

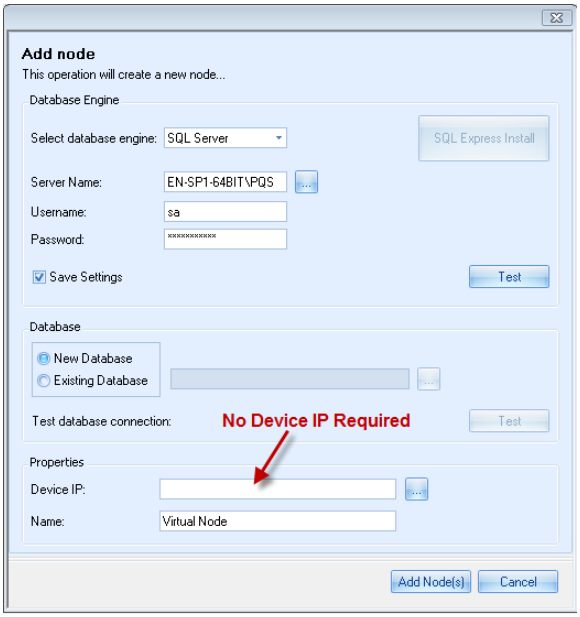
2 Downloaded PQZIP files can be loaded to a PQSCADA database just like a PQZIP file obtained from a BLACKBOX device, then viewed with the **Investigator** client software.

Creating a Virtual Node

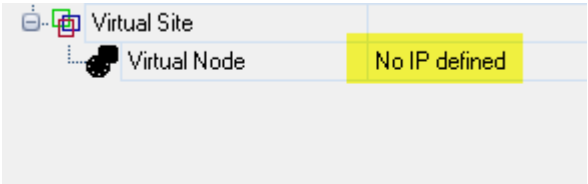
In order to view PQZIP files in another PQSCADA application for further investigation and analysis by Investigator, it is necessary to create a virtual node in the PQSCADA Management Studio.

To create a virtual *node*:

- **The process for creating a virtual node is similar to Adding a device node, except there is direct connection between the virtual node and the device. Therefore No IP selection is made. The purpose of this node is to create a logical location to store and parse data from a remote device. Refer to** Adding a New Node on page 37**.**



A virtual node is created with no directly attached device and No defined IP Address.



Appendix A: SQL Server 2005 Management Studio Express

Overview

Microsoft® SQL Server Management Studio Express (SSMSE) is graphical configuration tool for managing SQL Server 2005 Express Edition. The following procedure provides a detailed procedure on how to install the SSMSE configuration tool and give specifics on using the tool to change the default password.

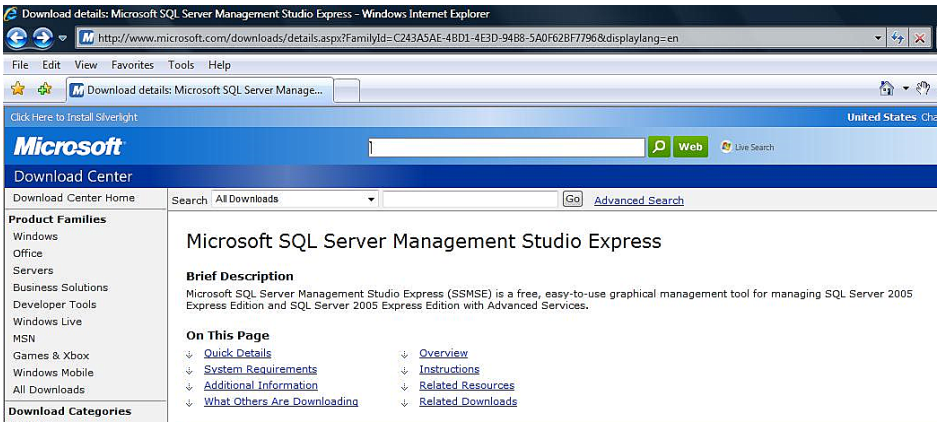
Installing SSMSE from the Microsoft® Web*Site*

To install SSMSE from the Microsoft® web***site***:

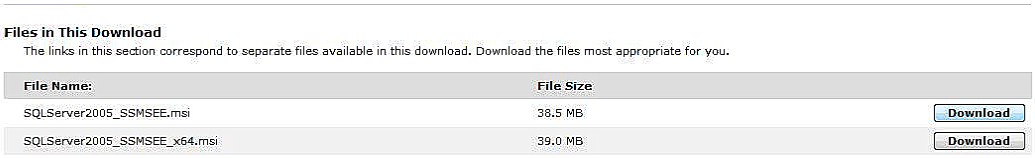
1. Click on the link below

   http://www.microsoft.com/downloads/details.aspx?FamilyId=C243A5AE-4BD1-4E3D-94B8-5A0F62BF7796&displaylang=en

The Microsoft® SQL Server Management Studio window appears:

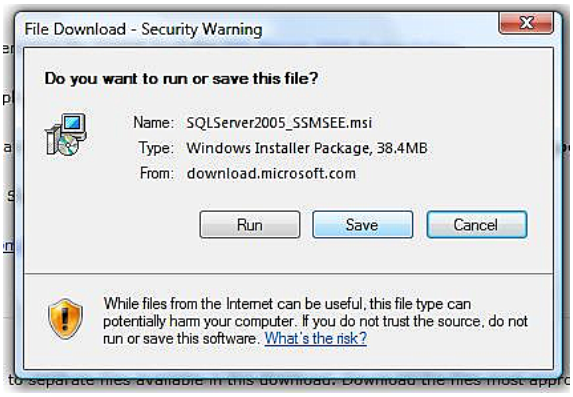


2. Scroll down, then click **Download** for the appropriate file

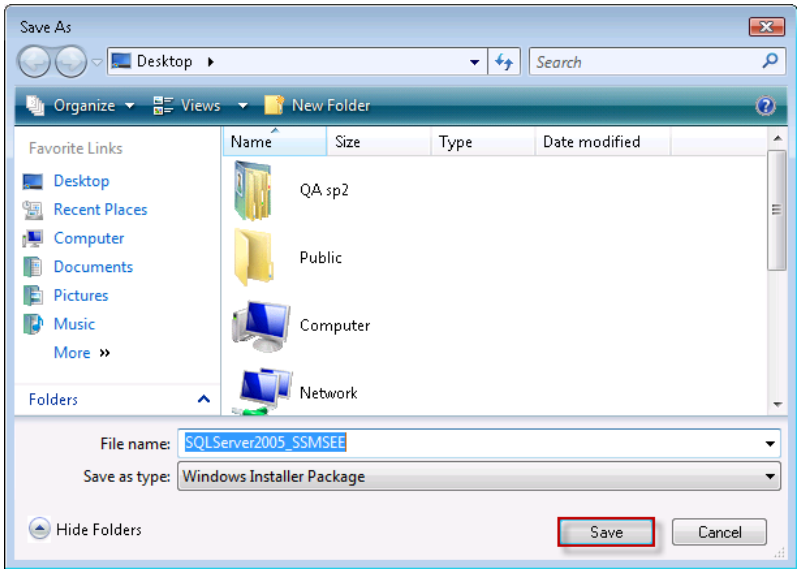


The file selection is dependent on your Operating System. SQLServer2005_SSMSEE_x64msi for a 64 bit O.S. and SQLServer2005_SSMSee.msi for a 32 bit O.S..

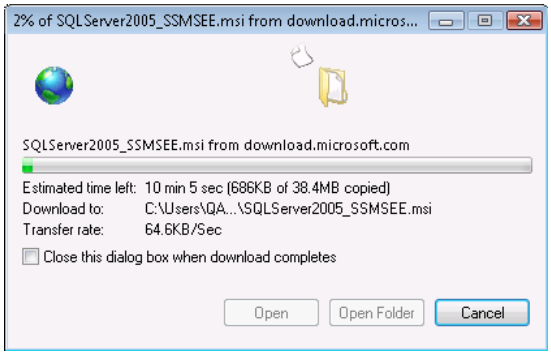
The File Download Security Warning appears:

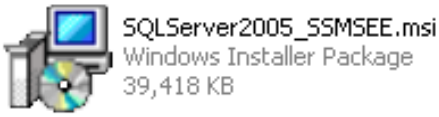


3. Click **Save** (We recommend saving the download file to the desktop)

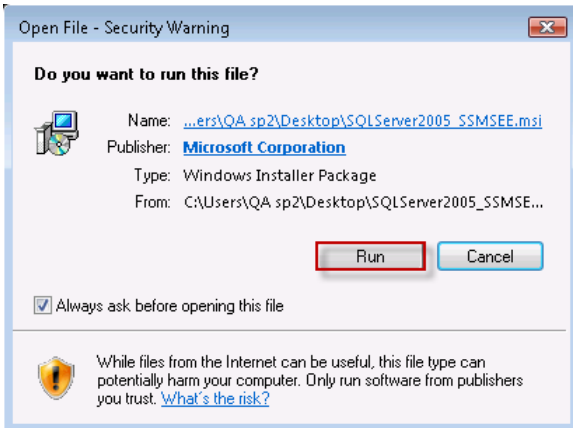


The downloading dialog box appears:

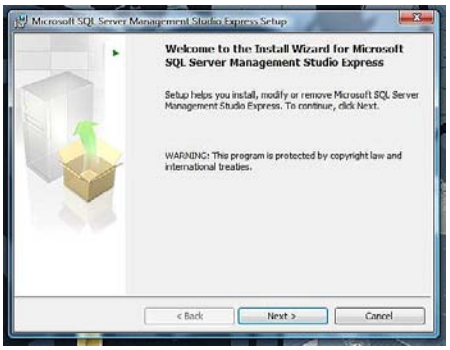


4. After downloading is complete, double click the **SQLServer2005_SSMSee.msi** file 

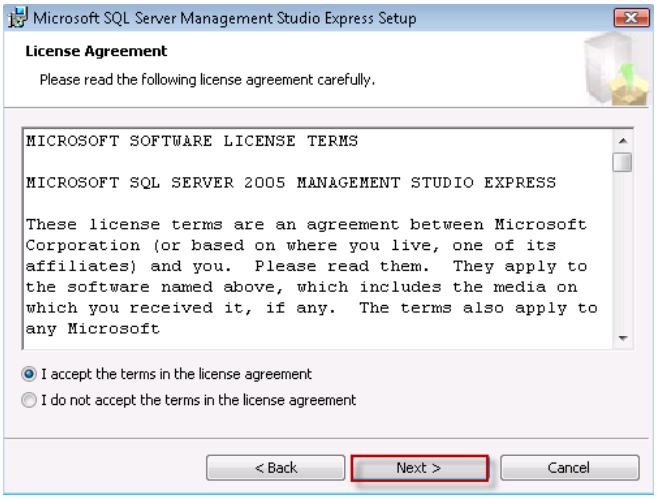
The Security Warning appears.



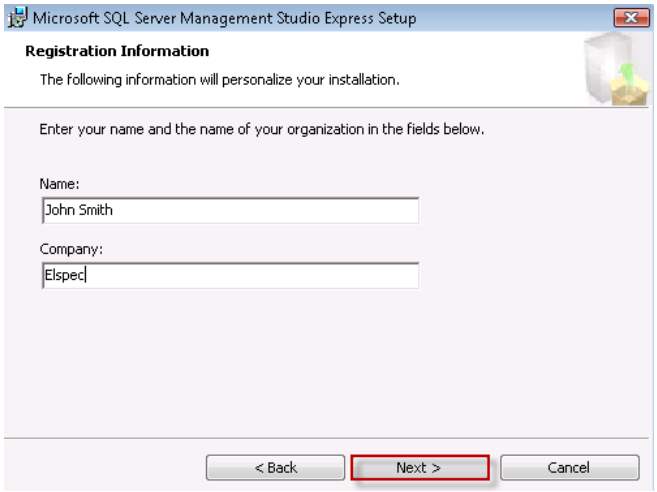
5. Click **Run** to commence the installation procedure.



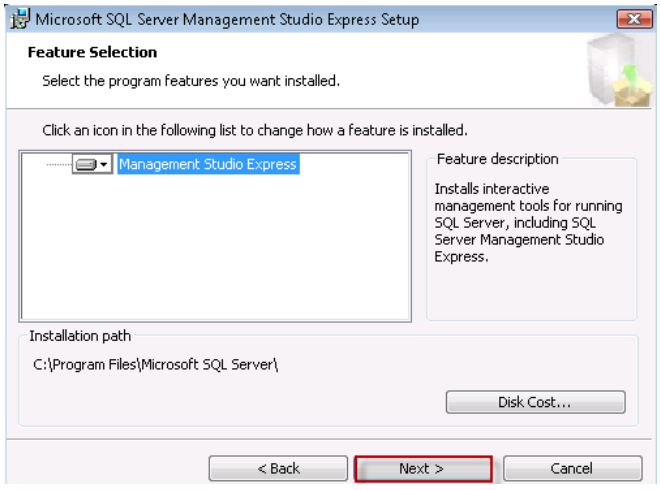
6. Click **Next** to continue**.**



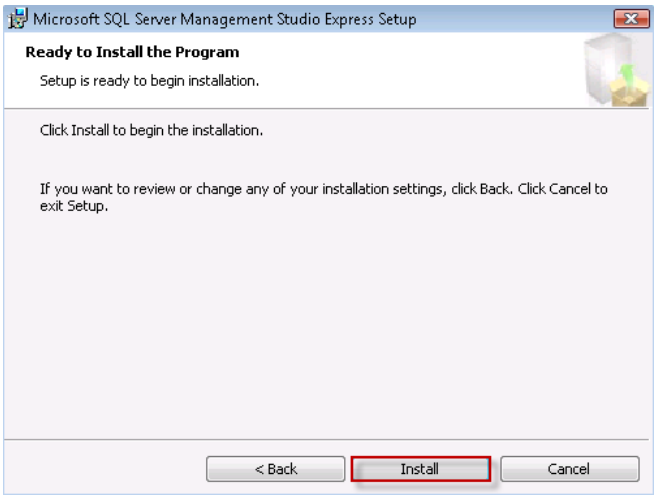
7. Select **I accept**, then click **Next** to continue.



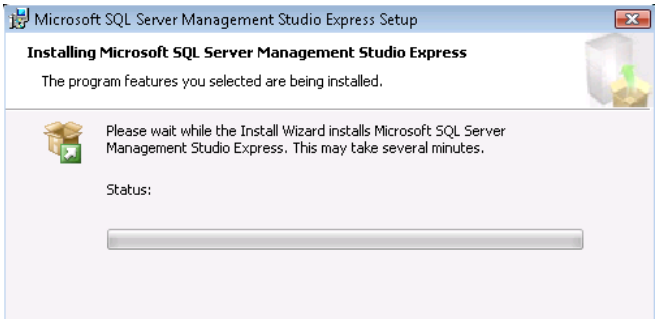
8. Enter **Name and Company**, then click **Next**.

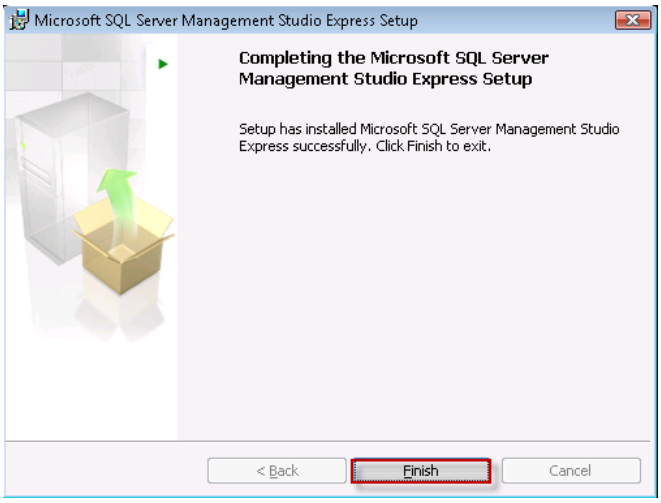


9. Accept the default features, then click **Next**.



10. Click **Install**.
11. The status window appears.





12. Click **Finish** to complete.

Security

The default database SQL server comes with default user name **sa (system administrator).** The following pages describe how to change the password both in the SSMSE configuration tool as well as the system database.

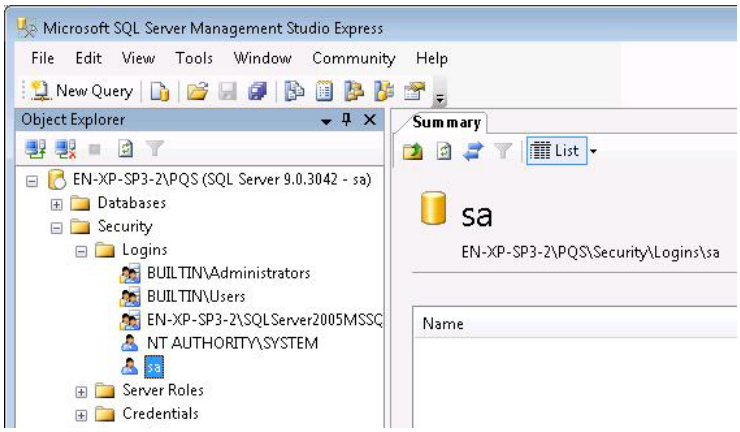
To change the password in SSMSE:

1. From the main window, select **Microsoft SQL Server 2005**.

The main menu opens with the **Connect to Server** window.
Use the default login name default **sa** for system administrator.

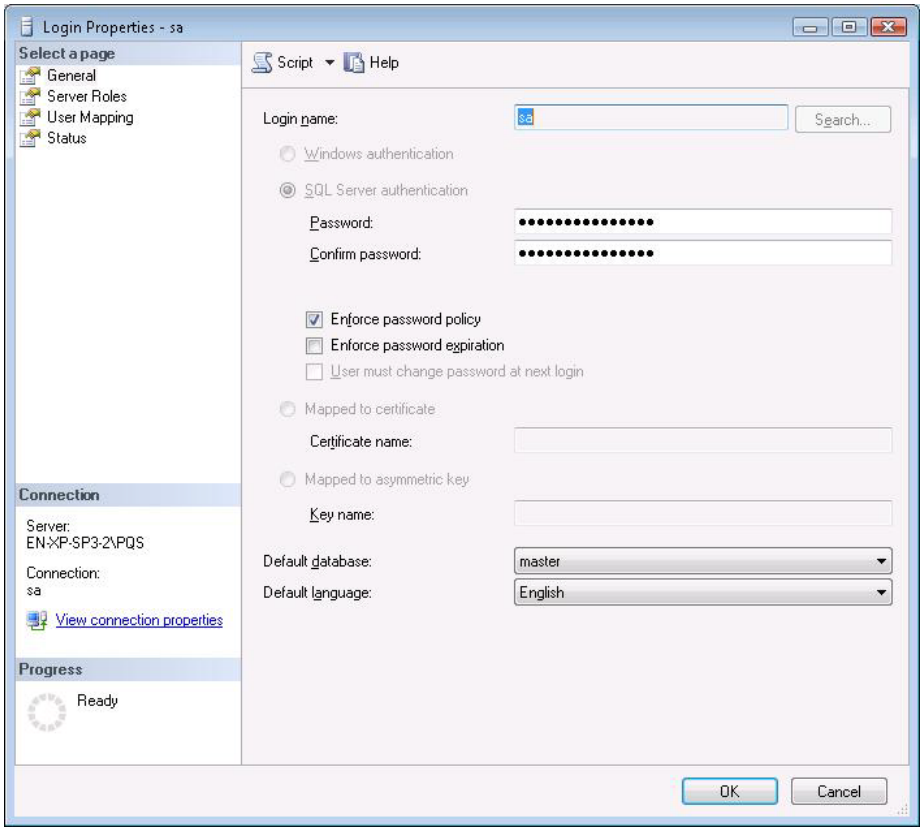
2. Login with current Password, then click **Connect**. (PQSpqs12345)

The Main SQL Server Management Studio Express window appears.



3. In the left menu bar, select **Security→Logins→sa**.
4. Double click **sa**.

The Login Properties window appears.

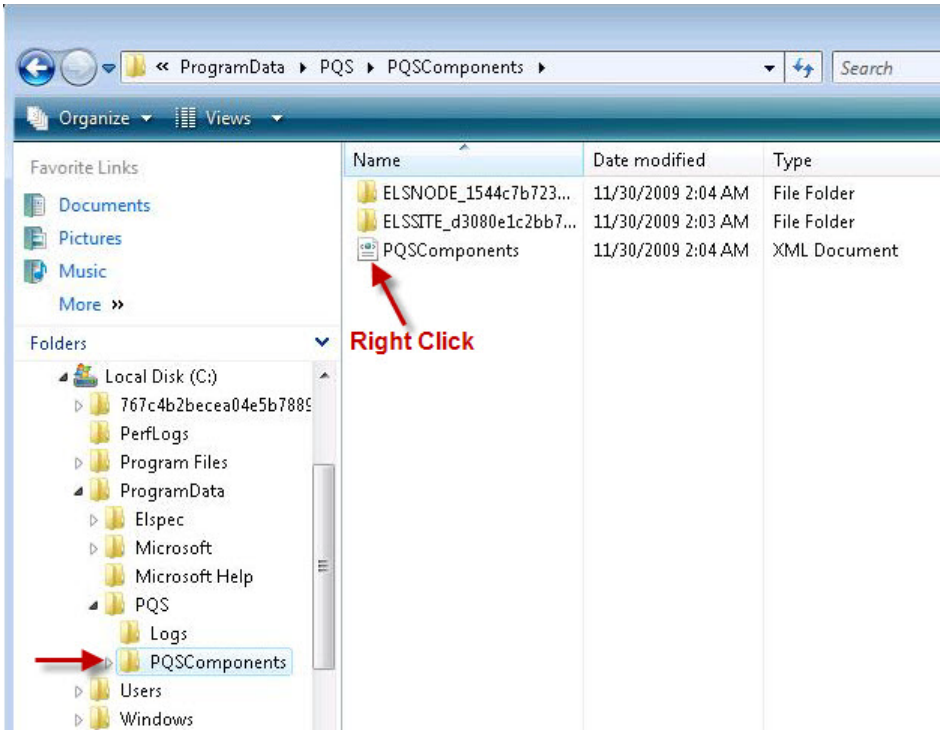


5. Enter the new Passord, then confirm.
6. Click **OK** to complete.

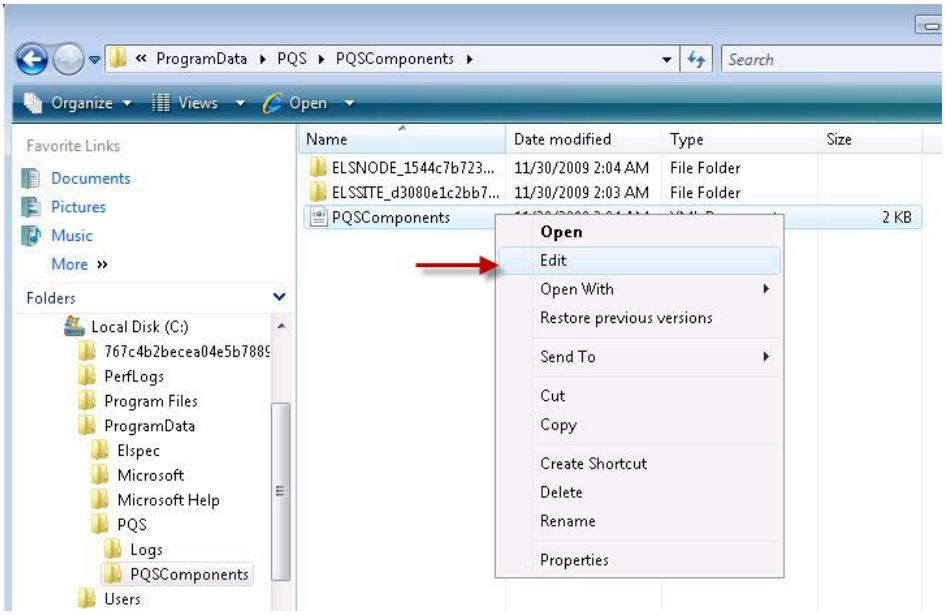
It is not sufficient to only change the password in the utility program; the password must also be changed in the corresponding PQSCADA database server.

To change password in the database server:

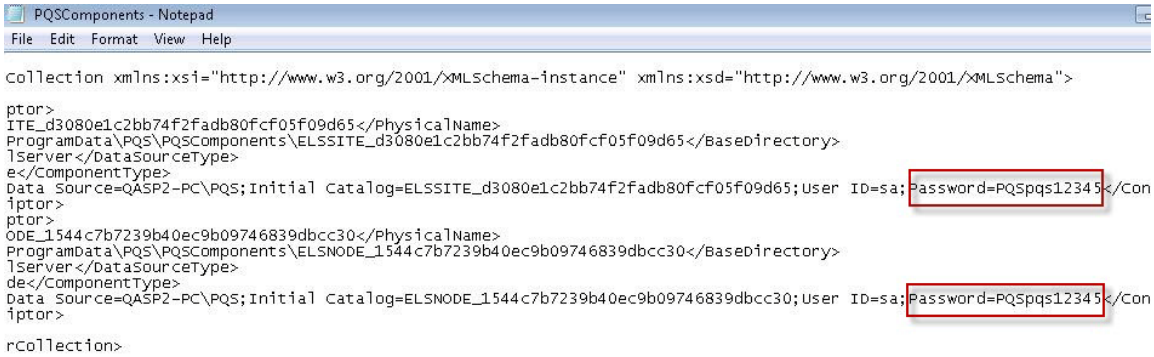
7. Navigate to the **PQS Components** folder.



8. Right click **PQSComponents.xml**



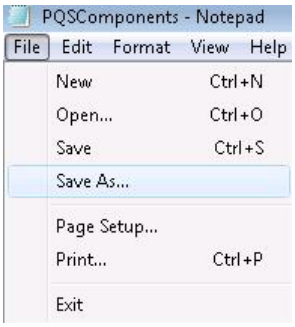
9. Select **Edit**.
10. The Source code appears in an editable format in Notepad.



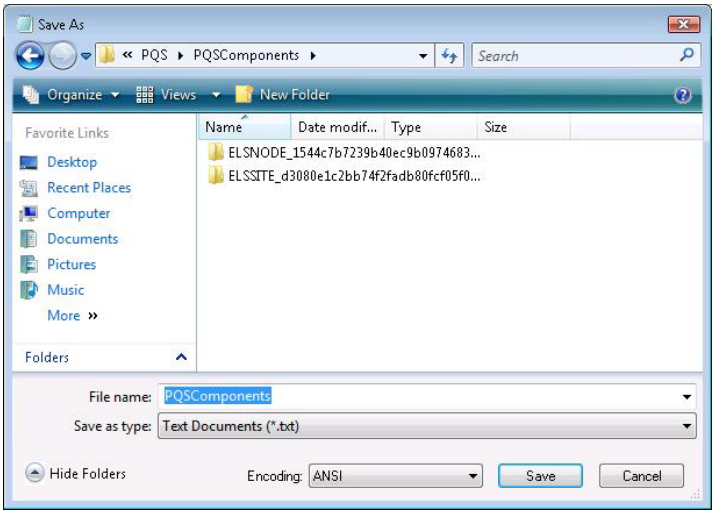
11. Change the password for both the ***Node*** and the ***Site***.

Please be very careful when updating this file.
Making a mistake can damage the PQSCADA.

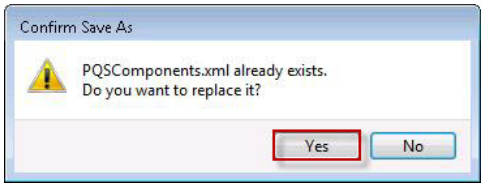
12. When complete, select **File→Save As**



13. Save under the same file name.

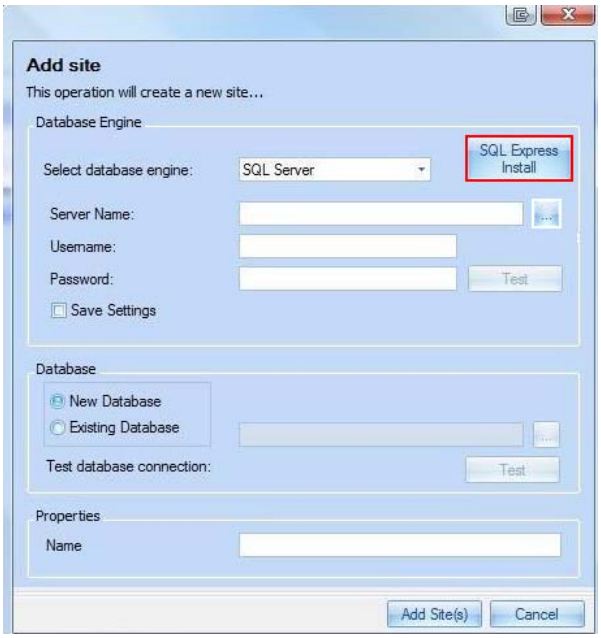


14. Select **Yes** to overwrite the existing file.



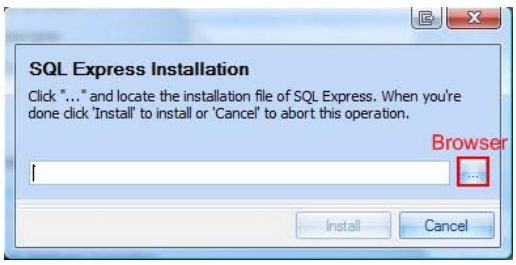
A restart of the PQSCADA is required for the changes to take effect.

Appendix B: SQL Express Install



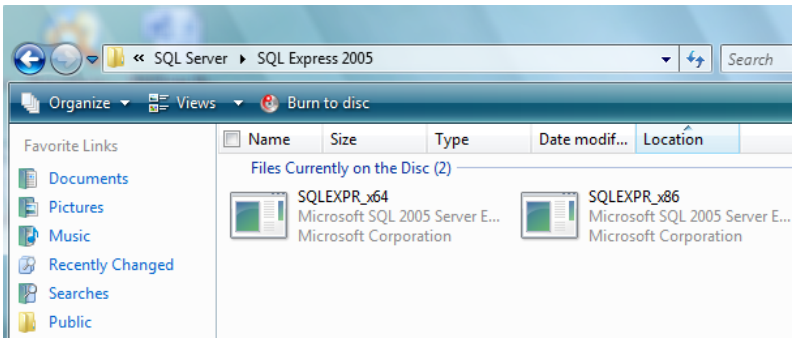
1. From the Add ***Site*** menu, click **SQL Express Install**.

The SQL Express Installation window appears.



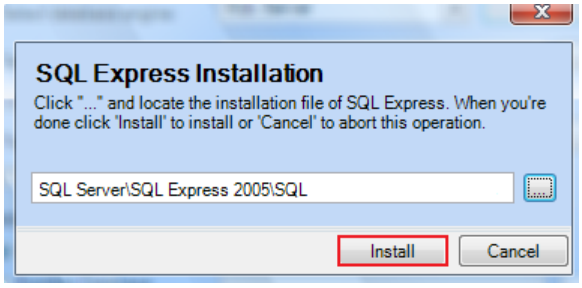
2. Click the browser button.
3. Navigate to the source file.

The file selection is dependent on your Operating System. SQLEXPR_x64 for a 64 bit O.S. or SQLEXPR_86 for a 32 bit O.S.



4. Double click the correct **SQL Express** file.

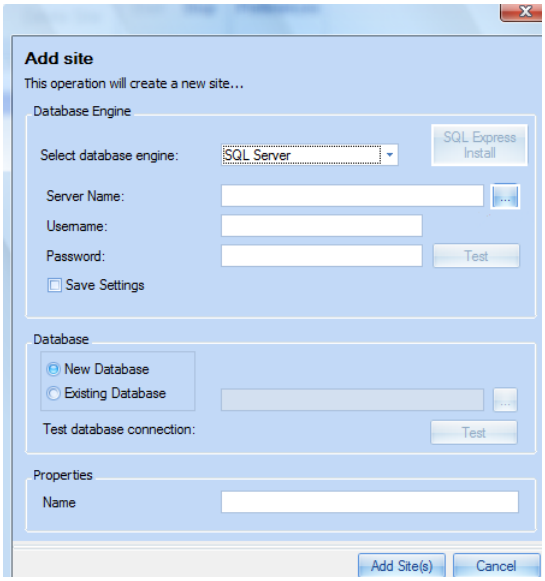
The SQL Express Installation window appears.



5. Click **Install** to complete.

This process can take up to 30 minutes to complete.

When complete, the **Add *Site*** dialog box appears.



6. Click the **Browser** button next to the Server name. 

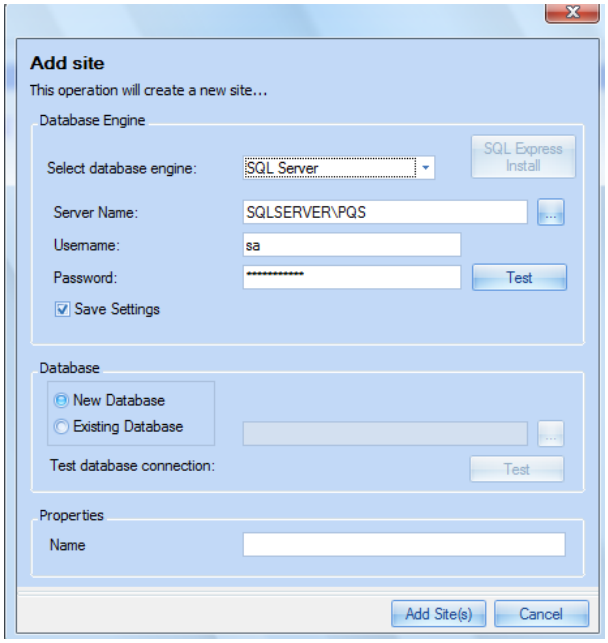
The browser button allows you to search for an available database server

The Select Database Server window appears.

7. Select Local Servers tab.

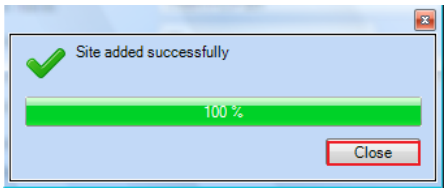
This opens open a table with the database list.

8. Double click the database that ends with **\PQS**.
9. The Add ***Site*** window reappears.



10. Enter user name: **sa**
11. Enter password**: PQSpqs12345**
12. Select **New Database** in the database section.
13. Assign a name for the ***Site*** (may be changed at a later date).
14. Click Add ***Site***(s).

The Add ***Site*** window appears when complete.



15. Resume at **Step 3: Adding a New Node on page 20.**

The default user name (sa) and password (PQSpqs12345) for the SQL Express database.

We recommend clicking Test to verify the connection.

We also recommend that you save your settings

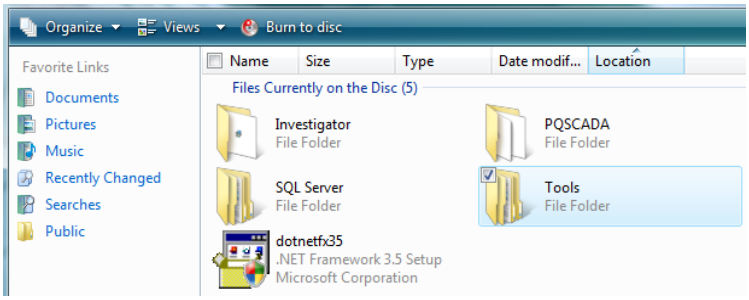
Appendix C: Installing Pre-requisites

If you do not currently have these programs, they can be found on the PQSCADA Installation disk or on the Web.

Installing MSI Installer

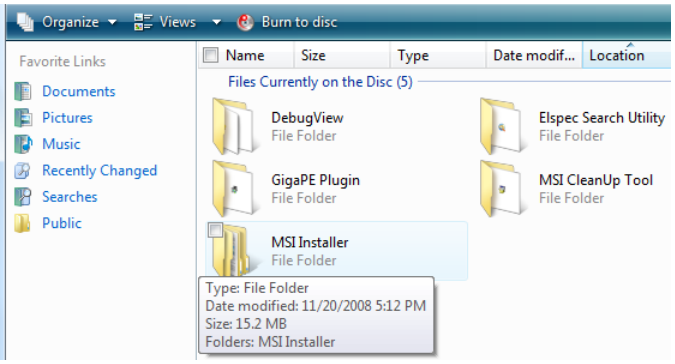
To install MSI Installer from the PQSCADA Installation disk:

1. Navigate to the files on the CD.



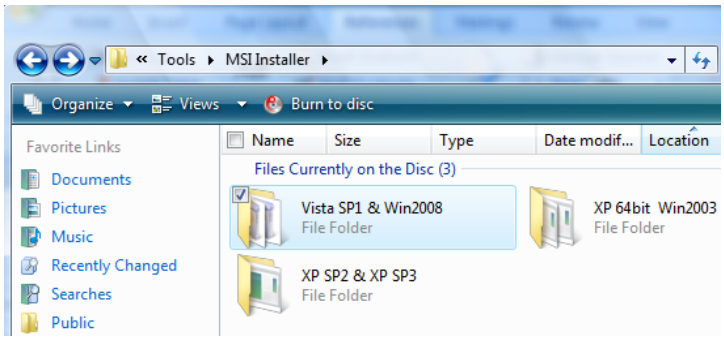
2. Double click the **Tools** folder.

The Tools window appears.



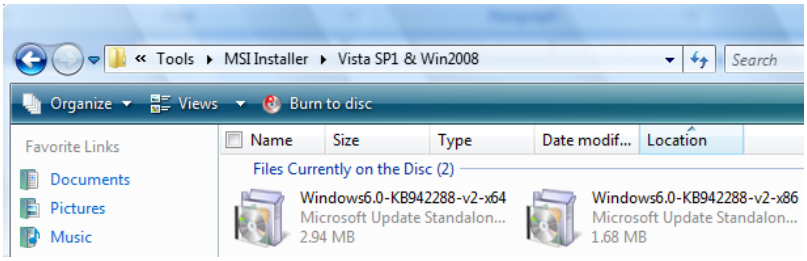
3. Double click the **MSI Installer** Folder.

The MSI Installer window appears.



4. Double click the folder that corresponds with your Operating System.

A window appears with available install files.



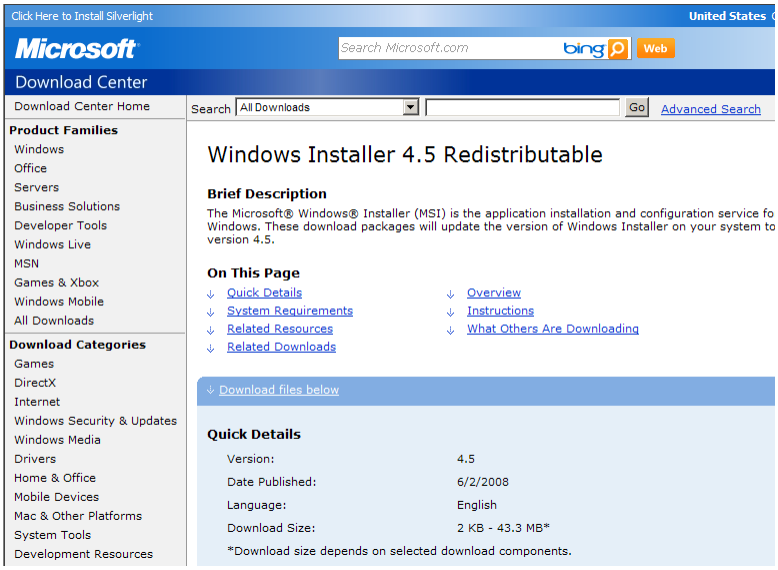
5. Double click the appropriate file to begin the installation process.
6. Follow the installer instructions to complete the installation.

In most cases, it is preferable to access the software from the PQSCADA disk because of the size of the download file.

To install MSI Installer from the Web:

1. Navigate to the Microsoft web***site*** at: http://www.microsoft.com/downloads/details.aspx?familyid=5A58B56F-60B6-4412-95B9-54D056D6F9F4&displaylang=en

The MSI download page appears.

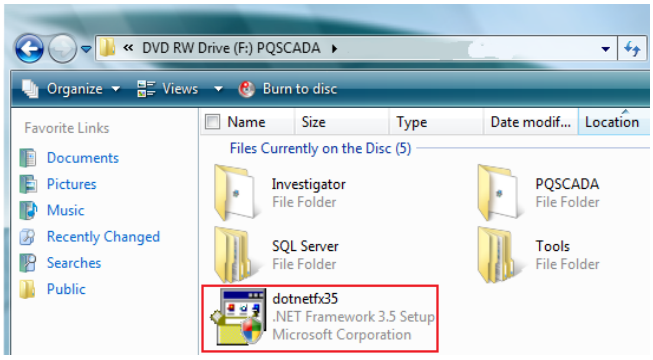


2. Download and complete the installation from the web***site***.

Installing .NET Framework 3.5sp1

To install .NET Framework 3.5sp1 from the PQSCADA Installation disk:

1. Navigate to the **dotnetx3.5.exe** file.

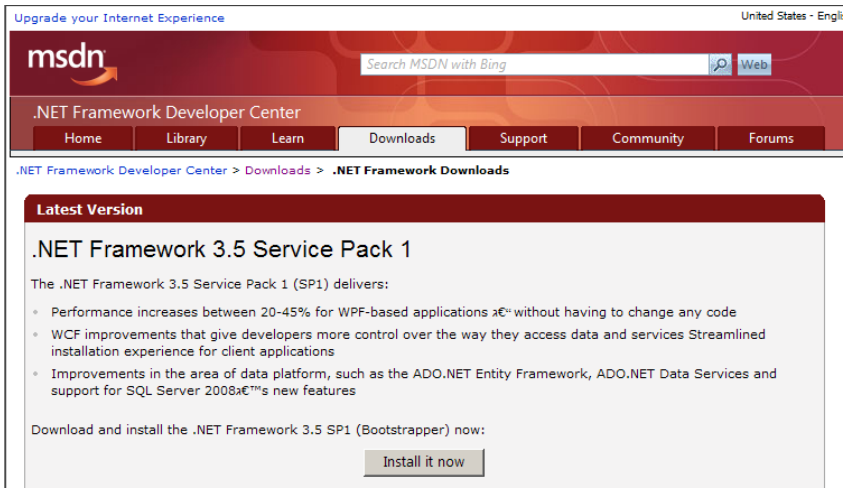


2. Double click dotnetfx35.exe.
3. Follow the installer instructions.

To install .NET Framework 3.5sp1 from the Web:

1. Navigate to the Microsoft web***site*** at: http://msdn.microsoft.com/en-us/netframework/aa569263.aspx

The **msdn** download ***Site*** appears.



2. Select **Install it now**.
3. Follow the installer instructions.

Appendix D: Upgrading from 3.0

The following procedure applies to upgrade installations of PQSCADA Version 3.0 or earlier. If you have a version 3.1.1.10 or 3.1.1.45, then please refer to the installation procedure on **Installing the PQSCADA Software on page 7.**

Warning: If you have not backed up your database yet, then you need to do so before proceeding. Refer to Appendix E: Backup the Database on page 107.

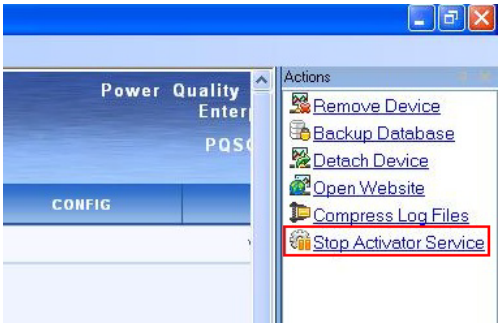
Stopping Activator Service

The first step before upgrading the PQSCADA is to stop the Activator Service

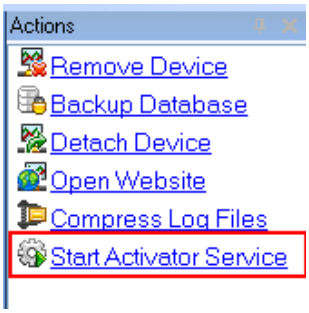
To stop Activator Service:

1. Start PQSCADA by double clicking the **PQSCADA desktop icon** 

The PQSCADA Management window appears.



2. Click Stop Activator Service.
3. A New PQSCADA Management window appears.



4. Close PQSCADA.

Disabling IIS Service

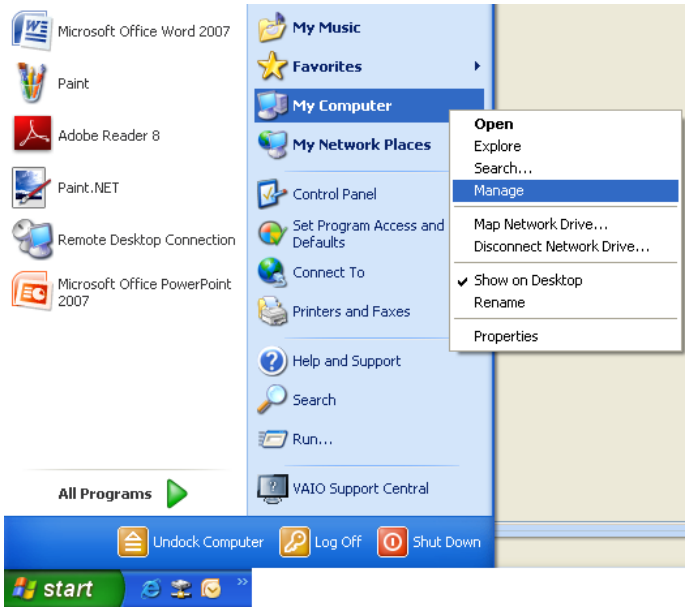
It is necessary to disable IIS so that it does not interfere with the installation. if you need to use the IIS service for another application on your PC, the other applications would have to be terminated before commencing the installation.

Warning: *If you have not backed up your database yet, then you need to do so before proceeding Refer to* *Appendix E: Backup the Database on page 107.*

To disable the IIS service:

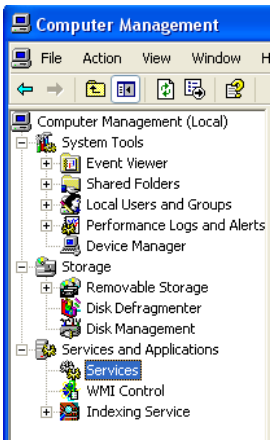
1. On your desktop, click **Start.**

A start menu appears.



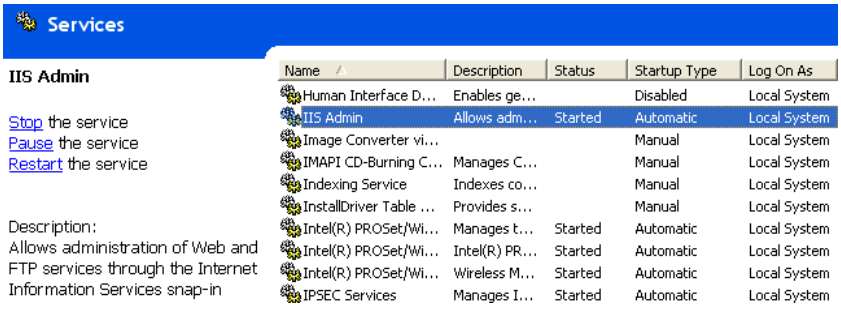
2. Right click **My Computer,** then select **Manage.**

The Computer Management window appears.

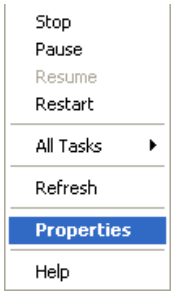


3. Select Services and Applications→Services.

The **Services** Window appears.

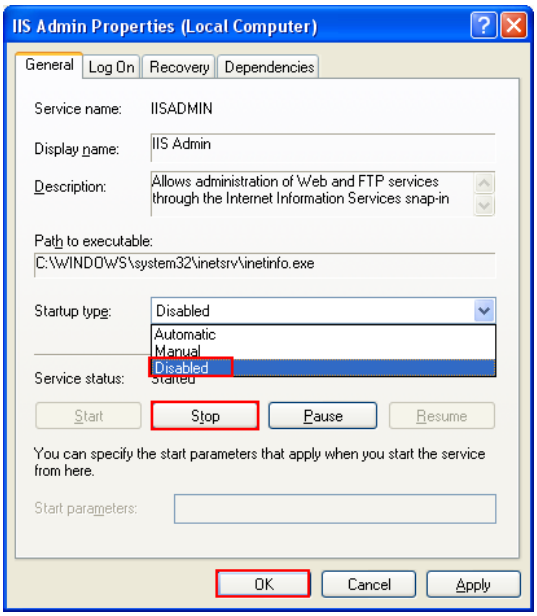


4. Right click **IIS Admin**.



5. Select **Properties**.

The **IIS Admin Properties** window appears.



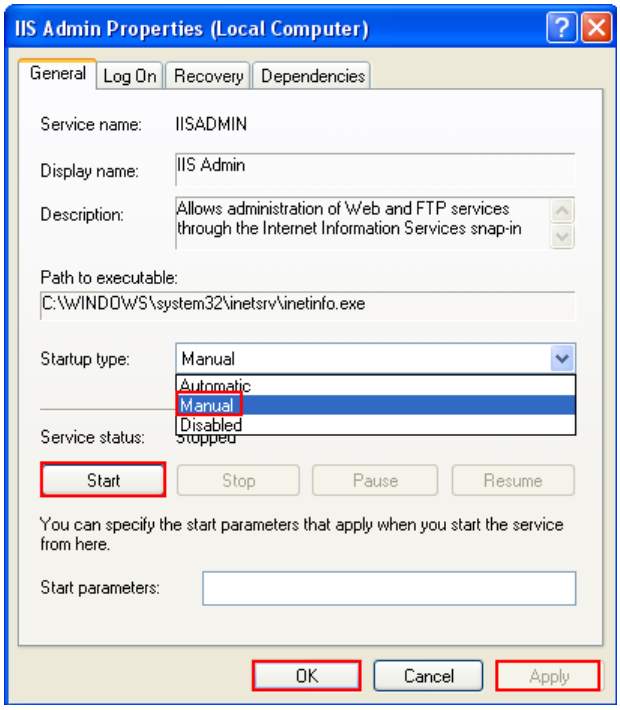
6. Change **Startup Type** to **Disabled**.
7. Change **Service status** to **Stop**.
8. Click **OK** to finish.

If you need to restore your original system, then Restart IIS as below.

To Restart IIS:

a) Perform steps 1-5 from Disabling IIS Service on page 103.

The IIS Admin Properties window appears.



b) Change **Start Up** type to **Manu**al.

c) Select A**pply**.

d) Change **Service status** to **Start**.

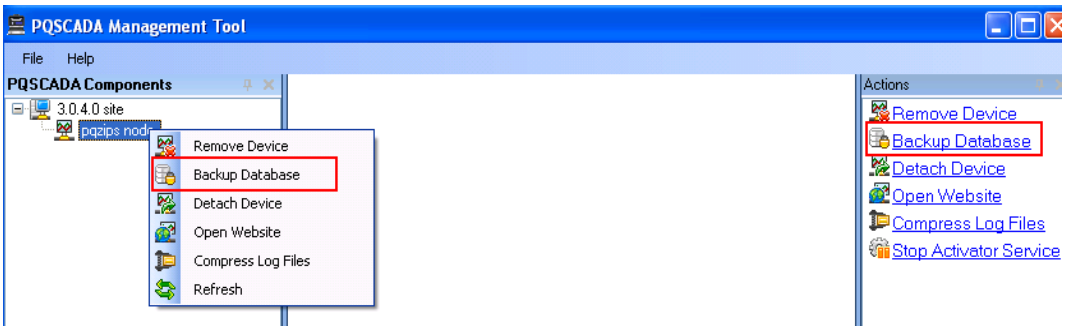
e) Click **OK** to finish.

Appendix E: Backup the Database

The following procedure applies to upgrade installations of PQSCADA Version 3.0 or earlier.

To backup the database:

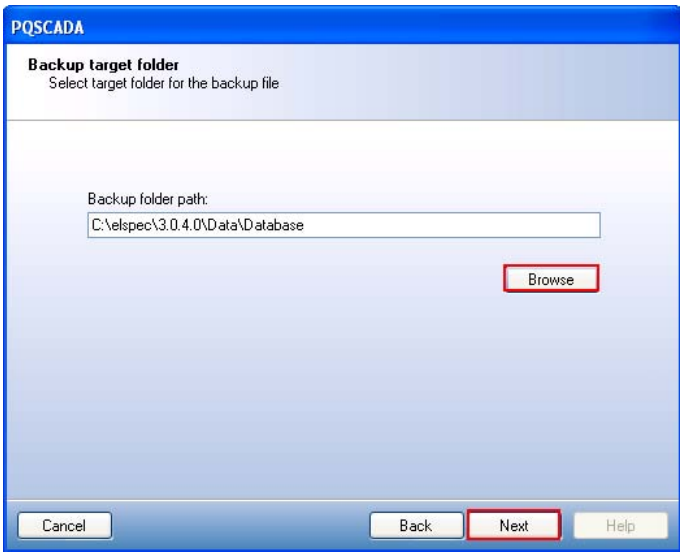
1. Right click the ***Node***, then select **Backup Database** or select **Backup Database** under Actions.



The Welcome screen appears.

2. Click **Next** to continue.

The Backup target folder appears.

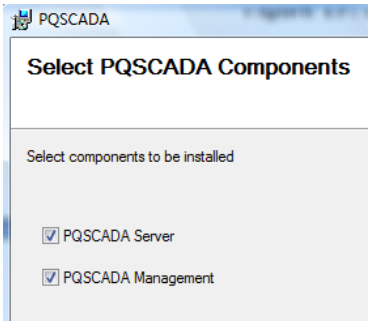


3. Select the desired backup folder
4. Click **Next** to complete the backup process.

Please do not back to the root directory C:\, Program Files, My Documents, or the Desktop. We recommend creating a new backup folder.

Appendix F: Starting/Stopping PQS through Windows

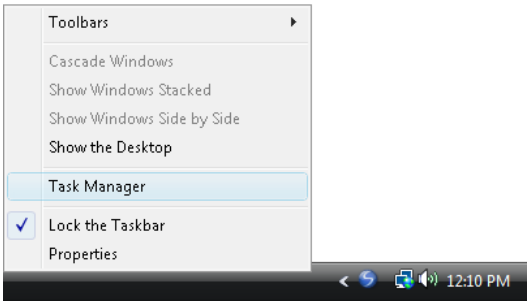
The PQSCADA installation procedure allows you to install both the **PQSCADA Management Studio** and the **PQSCADA Server** (PQS service). In order to stop and/or start the PQS service, you need to use the PQSCADA Management Studio or by accessing the **Services** through windows configuration. In this section there is a detailed explanation on how to access and use the **PQS Server** through MS Windows Vista ™.



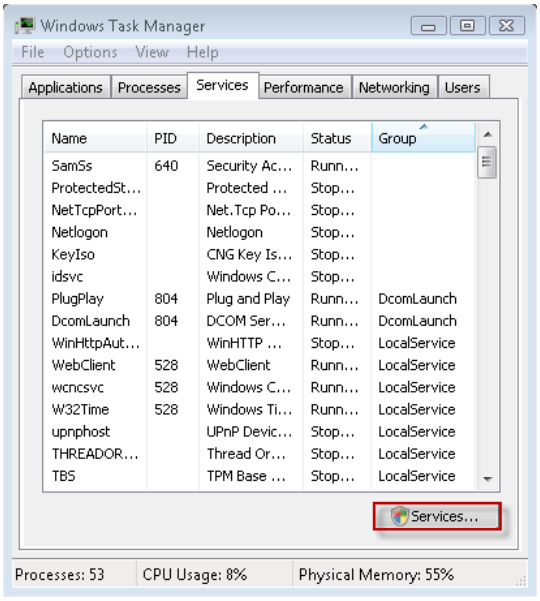
To start/stop PQS through Windows:

1. Right click the bottom system tray.

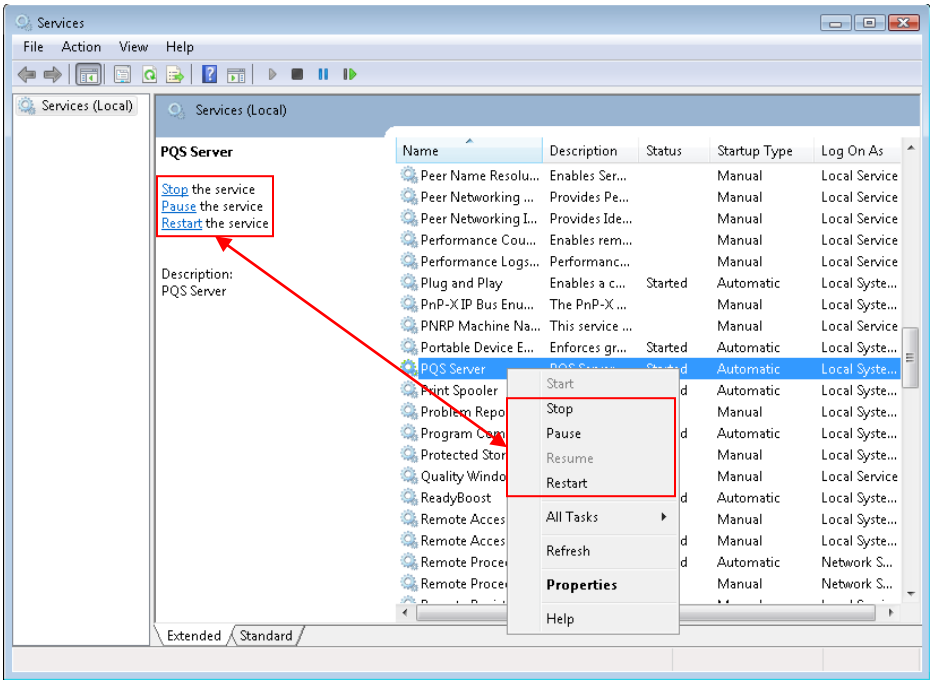
The Toolbar window appears.



2. Click Task Manager.
3. The Task Manager window appears.



4. Under the **Service** tab, Click **Services**.
5. The **Services** window appears.



6. Select PQS Server.
7. Select the desired function. (**Stop, Pause, or Restart**), from the window on the left or by right clicking the PQS Server.